rBOX103-FL Series

Robust Din-rail Fanless Embedded System User's Manual

Disclaimers

This manual has been carefully checked and believed to contain accurate information. Axiomtek Co., Ltd. assumes no responsibility for any infringements of patents or any third party's rights, and any liability arising from such use.

Axiomtek does not warrant or assume any legal liability or responsibility for the accuracy, completeness or usefulness of any information in this document. Axiomtek does not make any commitment to update the information in this manual.

Axiomtek reserves the right to change or revise this document and/or product at any time without notice.

No part of this document may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of Axiomtek Co., Ltd.

©Copyright 2012 Axiomtek Co., Ltd.
All Rights Reserved
March 2012, Version A1
Printed in Taiwan

Safety Precautions

Before getting started, please read the following important safety precautions.

1. The rBOX103-FL does not come equipped with an operating system. An operating system must be loaded first before installing any software into the computer.
2. Be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and place all electronic components in any static-shielded devices. Most electronic components are sensitive to static electrical charge.
3. Disconnect the power cord from the rBOX103-FL before making any installation. Be sure both the system and the external devices are turned OFF. Sudden surge of power could ruin sensitive components. Make sure the rBOX103-FL is properly grounded.
4. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
5. Turn OFF the system power before cleaning. Clean the system using a cloth only. Do not spray any liquid cleaner directly onto the screen.
6. Do not leave this equipment in an uncontrolled environment where the storage temperature is below -45℃ or above 85℃. It may damage the equipment.
7. Do not open the system's back cover. If opening the cover for maintenance is a must, only a trained technician is allowed to do so. Integrated circuits on computer boards are sensitive to static electricity. To avoid damaging chips from electrostatic discharge, observe the following precautions:
   - Before handling a board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. This will help to discharge any static electricity on your body.
   - When handling boards and components, wear a wrist-grounding strap, available from most electronic component stores.

Classification

1. Degree of production against electric shock: not classified
2. Degree of protection against the ingress of water: IP30
3. Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.
4. Mode of operation: Continuous
5. Type of protection against electric shock: Class I equipment

General Cleaning Tips

You may need the following precautions before you begin to clean the computer. When you clean any single part or component for the computer, please read and understand the details below fully.

When you need to clean the device, please rub it with a piece of dry cloth.

1. Be cautious of the tiny removable components when you use a vacuum cleaner to absorb the dirt on the floor.
2. Turn the system off before you start to clean up the component or computer.
3. Never drop the components inside the computer or get circuit board damp or wet.
4. Be cautious of all kinds of cleaning solvents or chemicals when you use it for the sake of cleaning. Some individuals may be allergic to the ingredients.
5. Try not to put any food, drink or cigarette around the computer.

Cleaning Tools:

Although many companies have created products to help improve the process of cleaning your computer and peripherals users can also use household items to clean their computers and peripherals. Below is a listing of items you may need or want to use while cleaning your computer or computer peripherals.

Keep in mind that some components in your computer may only be able to be cleaned using a product designed for cleaning that component, if this is the case it will be mentioned in the cleaning.

- Cloth: A piece of cloth is the best tool to use when rubbing up a component. Although paper towels or tissues can be used on most hardware as well, we still recommend you to rub it with a piece of cloth.
- Water or rubbing alcohol: You may moisten a piece of cloth a bit with some water or rubbing alcohol and rub it on the computer. Unknown solvents may be harmful to the plastics parts.
- Vacuum cleaner: Absorb the dust, dirt, hair, cigarette particles, and other particles out of a computer can be one of the best methods of cleaning a computer. Over time these items can restrict the airflow in a computer and cause circuitry to corrode.
- Cotton swabs: Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas in your keyboard, mouse, and other locations.
- Foam swabs: Whenever possible it is better to use lint free swabs such as foam swabs.

Note ***We strongly recommended that you should shut down the system before you start to clean any single components*****.**

Please follow the steps below:

1. Close all application programs
2. Close operating software
3. Turn off power
4. Remove all device
5. Pull out power cable

Scrap Computer Recycling

If the computer equipments need the maintenance or are beyond repair, we strongly recommended that you should inform your Axiomtek distributor as soon as possible for the suitable solution. For the computers that are no longer useful or no longer working well, please contact your Axiomtek distributor for recycling and we will make the proper arrangement.

Trademarks Acknowledgments

Axiomtek is a trademark of Axiomtek Co., Ltd. IBM, PC/AT, PS/2, VGA are trademarks of International Business Machines Corporation.
Intel® and Pentium® are registered trademarks of Intel Corporation.
MS-DOS, Microsoft C and QuickBASIC are trademarks of Microsoft Corporation.
VIA is a trademark of VIA Technologies, Inc.
SST is a trademark of Silicon Storage Technology, Inc.
UMC is a trademark of United Microelectronics Corporation. Other brand names and trademarks are the properties and registered brands of their respective owners.

Table of Contents

Disclaimers ii
Safety Precautions iii
Classification iv
General Cleaning Tips iv
Scrap Computer Recycling vi

CHAPTER 1 INTRODUCTION 1
1.1 General Description 1
1.2 System Specifications 5
1.2.1 CPU 5
1.2.2 Chipset 5
1.2.3 BIOS 5
1.2.4 System Memory 5
1.2.5 Graphics Chip 5
1.2.6 Video Memory 6
1.2.7 LAN 6
1.2.8 Storage 7
1.2.9 USB 8
1.2.10 COM 11
1.2.11 CANBus 15
1.2.12 Power 19
1.2.13 WatchDog Timer (WDT) 20
1.2.14 System LED 23
1.2.15 Alarm Contact 33
1.2.16 Wireless (3G, GPRS) 41
1.2.17 Reset Bottom 41
1.2.18 Operation Temperature 41
1.2.19 Storage Temperature 42
1.2.20 Humidity 42
1.2.21 Weight 42
1.2.22 Dimensions 42
1.2.23 System I/O Outlet 42
1.3 Dimensions 43
1.4 I/O Outlets 44
1.5 Packing List 46

CHAPTER 2 HARDWARE INSTALLATION 47
2.1 Installing the Memory Module 47
2.2 Installing the CompactFlashTM Card 51
2.2.1 Installing Din-rail Mounting 56
2.2.2 Setting up rBOX by Din-rail mounting 62

2.3 Installing Wall Mounting (optional) 65

CHAPTER 3 PHOENIX-AWARD BIOS UTILITY 69
3.1 Entering Setup 69
3.2 Control Keys 70
3.3 Getting Help 71
3.4 The Main Menu 72
3.5 Standard CMOS Setup Menu 73
3.6 Advanced BIOS Features 75
3.7 Advanced Chipset Features 84
3.8 Integrated Peripherals 87
3.9 Power Management Setup 96
3.10 PnP/PCI Configuration Setup 97
3.11 PC Health Status 103
3.12 Load Optimized Defaults 104
3.13 Set Supervisor/User Password 105
3.14 Save & Exit Setup 107
3.15 Exit Without Saving 108

CHAPTER 4 INSTALLATION OF DRIVERS 109
4.1 Installation Of LAN Driver Update 109
4.2 Notice For Installation Of Driver 121

CHAPTER 5 Using AXCAN Software Utility 123
5.1 Installation Of CAN Utility 123
5.2 Overview 129
5.3 Connect Setting Window 130
5.4 Transmit Setting Window 134
5.5 Receive-Formatted Setting Window 140
5.6 Receive-Raw Setting Window 145
5.7 Config Setting Window 147
5.8 Others 148

CHAPTER 6 CAN Commands Available 155
6.1 Overview 155
6.2 Summary Table of All Commands 156
6.3 Identifier Filtering 185
6.4 Data Format 186
6.5 Error Code 187
6.6 How to Send Commands via Hyperterminal 188
6.7 Some Examples 202

CHAPTER 1
INTRODUCTION

This chapter contains general information and detailed specifications of the rBOX103-FL. The Chapter 1 includes the following sections:

- General Description
- System Specification
- Dimensions
- I/O Outlets
- Package List

1.1 General Description

The rBOX103-FL Din-rail fanless embedded systems are ideal for CAN-based applications that need high-speed transmission and efficient error detection mechanisms in critical environments. Built for rugged work environments, the rBOX103-FL series features an extra low power consumption Intel® ATOM™ Z510PT (1.1 GHz) or Z520PT (1.33 GHz) processors supporting industrial temperature range of -40℃ to +70℃. Their front accessible I/O cabling is very convenient for wiring and maintenance. The rBOX103-FL series offers a VGA output, making it particularly well-suited for communication control, SCADA and industrial automation. Its compact size with Din-rail mounting allows for easy installation into control cabinet. Pre-installed with Linux, Windows® CE 6.0. Windows® 7 embedded or Windows® XP embedded, the rBOX103-FL series provides programmers with a friendly environment for developing application software at a lower cost.

The rBOX103-FL is robust industrial-grade hardware design and adopts the advanced cooling system, besides, supporting the CompactFlash™, which makes it especially suitable for field control & monitoring system solution for following markets:

- Utility Industries (Water; Energy; Chemical Plant; Mining…)
- Public Transportation Industries (Traffic/ Highway Control; Train/Bus Control …)
- Homeland Security (Weather Monitoring/Alarm System …)

➢ Features

1. Fanless and no internal cabling design
2. Wide temperature operation of -40℃ - +70℃
3. 2 CAN 2.0 A/B interfaces
4. Supports 2 Ethernets with Magnetic Isolation Protection
5. 2 Watchdog Timers
6. LED Indicators (Power, Alarm, Ready/Active, COM (TXD,RXD), CAN (Act, Termination))
7. Wireless (3G or GPRS)
8. SNMP V1/V2c
9. Support one CompactFlash™
10. 2 power paths with terminal block and 12–48VDC
11. Din-rail mounting
12. Wall mounting (optional)
13. Meet safety agency requirements (UL508, UL60950) & passed heavy industrial EMI/EMS testing (ex: EN61000-6-4, EN61000-6-2)

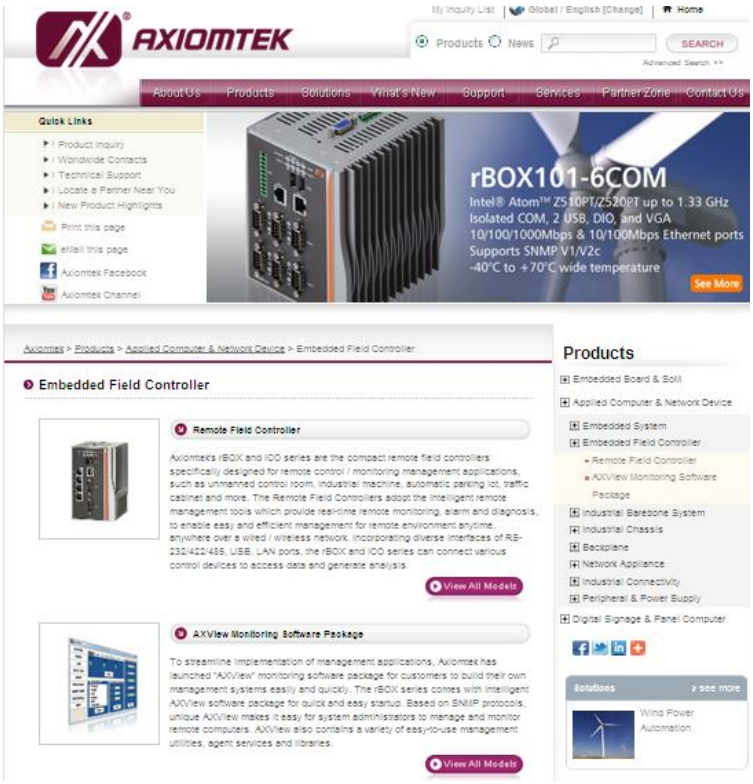
- Embedded O.S. Supported

  The rBOX103-FL not only supports Windows® XP, but also supports embedded OS, such as Windows® XP embedded, Windows® 7 embedded, Windows® CE 6.0 and Linux. For storage device, the rBOX103-FL supports one type II CompactFlash™ slot.

- Intelligent AXView & SNMP V1/V2c

  The rBOX103 features SNMP V1/V2c support for secured network management. To streamline implementation of management applications, Axiomtek has launched exclusive "AXView" monitoring software package for customers to build their own management systems easily and quickly. Axiomtek AXView also contains a variety of easy-to-use management utilities, agent services and libraries. For more product information, please visit our global website on Axiomtek AXView

http://axiomtek.com/products/ListProductType.asp?ptype1=209&ptype2=229



NOTE ***Axiomtek AXView will be updated while new rBOX model being released or functions being upgraded, pls always take the newest version from Axiomtek's website directly.***

1.2 System Specifications

1.2.1 CPU

- Onboard Intel® ATOM™ Z510PT (1.1 GHz) or Z520PT (1.33 GHz) processors with FSB 400/533MHz.

1.2.2 Chipset

- Intel System Controller Hub US15WPT

1.2.3 BIOS

- Phoenix AwardBIOS

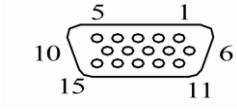
1.2.4 System Memory

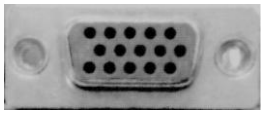
- One 200-pin SO-DIMM support DDR2 400/533MHz max. up to 2GB

1.2.5 Graphics Chip

- Intel GMA500 graphics Core integrate in US15W PT
- DB15 VGA port
- VGA IO Pin Define :

Pin	Signal	Pin	Signal	Pin	Signal
1	Red	2	Green	3	Blue
4	N.C.	5	GND	6	DETECT
7	GND	8	GND	9	VCC
10	GND	11	N.C.	12	DDC DATA
13	Horizontal Sync	14	Vertical Sync	15	DDC CLK





1.2.6 Video Memory

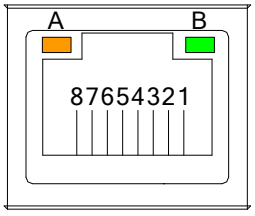
- Share Memory max. up to 256MB

1.2.7 LAN

- LAN 1 :
  - GBE Intel 82574, 10/100/1000Mbps LAN w/ Magnetic Isolation Protection 1.5KV
  - LED definition: Active LED (Yellow flashing), 10 LAN LED (NO Light), 100 LAN LED (Green Light), 1000 LAN LED (Orange Light)
- LAN 2 :
  - FE Davicom DM9102HI, 10/100Mbps LAN w/Magnetic Isolation Protection 1.5KV
  - LED definition: Active LED (Yellow flashing), 10 LAN LED (NO Light), 100 LAN LED (Green Light)
- LAN Pin Define :

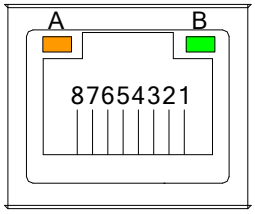
FE(10M/100M)

Pin	Signal
1	Tx+(Data transmission positive)
2	Tx-(Data transmission negative)
3	Rx+(Data reception positive)
4	RJ45 termination
5	RJ45 termination
6	Rx- (Data reception negative)
7	RJ45 termination
8	RJ45 termination
A	Active LED(Yellow)
B	100 LAN LED(Green)



GbE(10M/100M/1000M)

Pin	Signal
1	MDI0+
2	MDI0-
3	MDI1+
4	MDI1-
5	MDI2+
6	MDI2-
7	MDI3+
8	MDI3-
A	Active LED (Yellow)
B	100 LAN LED (Green)/ 1000 LAN LED (Orange)

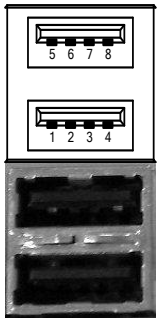


1.2.8 Storage

- 1 x CompactFlash TypeII

1.2.9 USB

- 2 x USB2.0
- With power distribution control and over current protection
- USB Pin Define :

Pin	Signal USB Port 0	Pin	Signal USB Port 1	
1	USB VCC (+5V level)	5	USB VCC (+5V level)	
2	USB #0_D-	6	USB #1_D-	
3	USB #0_D+	7	USB #1_D+	
4	Ground (GND)	8	Ground (GND)	

- USB power (5V) distribution control.

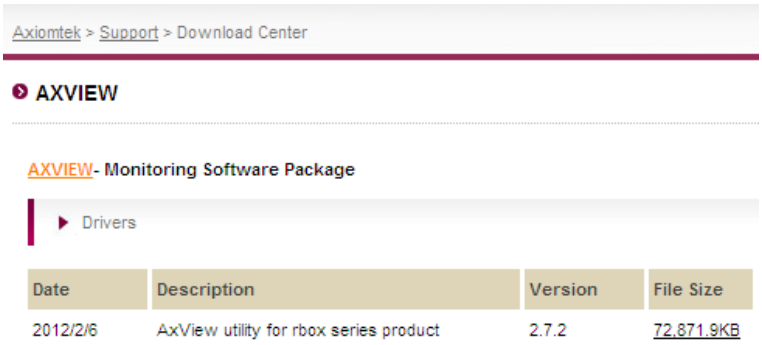
  Some program and sample code for USB power distribution control are offered in Windows and Linux.

  - Windows : Please refer it from our Axiomtek AXView which on *Axiomtek's website* directly.

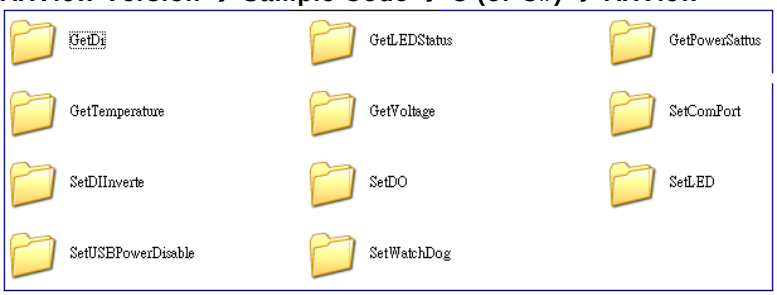
  - Linux : Please refer it from our Axiomtek's website directly.

- **Axiomtek's website for AXView :**

http://axiomtek.com/products/ViewDownload.asp?View=1001

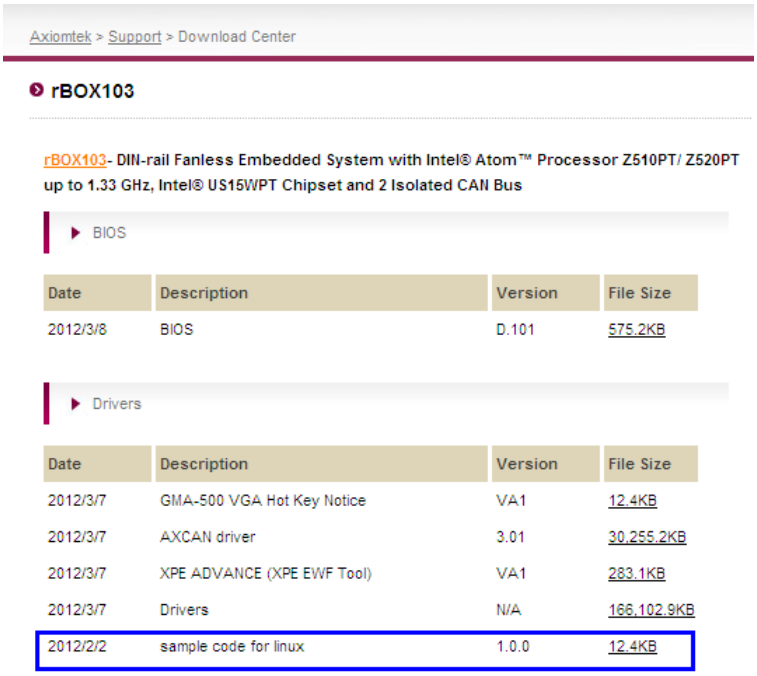


AXView Version → Sample Code → C (or C#) → AXView



- **Axiomtek's website for Linux :**

http://axiomtek.com/products/ViewDownload.asp?View=955



Axiomtek > Support > Download Center

rBOX103

rBOX103- DIN-rail Fanless Embedded System with Intel® Atom™ Processor Z510PT/ Z520PT up to 1.33 GHz, Intel® US15WPT Chipset and 2 Isolated CAN Bus

▶ BIOS

Date	Description	Version	File Size
2012/3/8	BIOS	D.101	575.2KB

▶ Drivers

Date	Description	Version	File Size
2012/3/7	GMA-500 VGA Hot Key Notice	VA1	12.4KB
2012/3/7	AXCAN driver	3.01	30,255.2KB
2012/3/7	XPE ADVANCE (XPE EWF Tool)	VA1	283.1KB
2012/3/7	Drivers	N/A	166,102.9KB
2012/2/2	sample code for linux	1.0.0	12.4KB

USB Power Distribution Control Sample code:

- **Windows:**

\rBOX101-FL\AXView Version 2.7.2\Sample code\c\AXView\SetUSBPowerDisable\AXVIEW_DLL_Test.cpp

- **Linux:**

\rBox103-bsp-user-1.0.0\rbox103\src\librb100.c

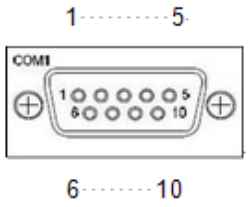
int _rb201_usb_power(int number, int onoff)

1.2.10 COM

- 2 ports DB9 Pin Define RS-232/422/485
- ESD Protection 15KV
- Magnetic Isolation Protection 2KV
- COM1,COM2 speed up to 115.2kbps
- rBOX support jumper less design. All of the COM port interface RS232/422/485 can be selected by BIOS menu or software program.
- It also supports Auto Flow Control in RS485 mode
- Serial Port Pin Define : (DB9 Male)

COM1/COM2

Pin	RS-232	RS-422	RS-485
1	DCD	TX-	Data-
2	RXD	TX+	Data+
3	TXD	RX+	--
4	DTR	RX-	--
5	Ground	Ground	Ground
6	DSR	--	--
7	RTS	--	--
8	CTS	--	--
9	RI	--	--

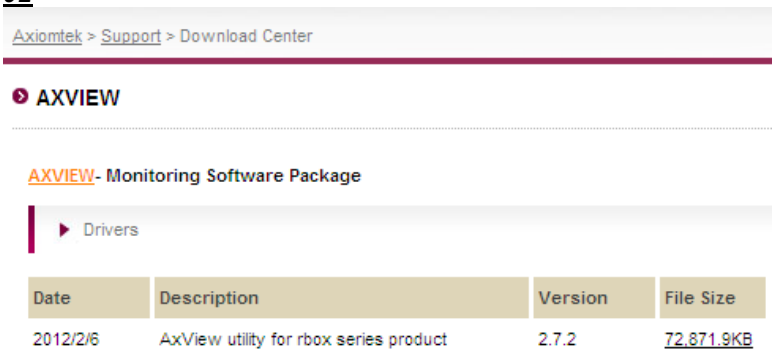


- Some program and sample code for COM port interface type are offered in Windows and Linux.

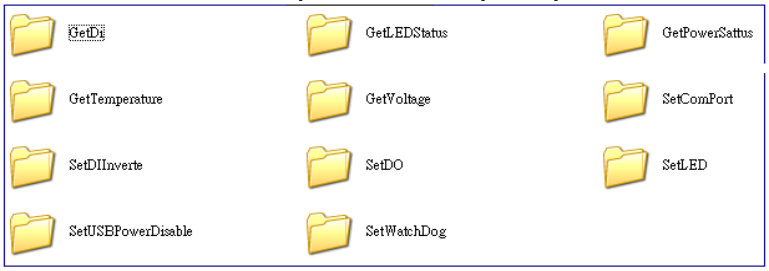
  - Windows : Please refer it from our Axiomtek AXView which on Axiomtek's website directly.

  - Linux : Please refer it from our *Axiomtek's website* directly.

➢ **Axiomtek's website for AXView :**
http://axiomtek.com/products/ViewDownload.asp?View=1001

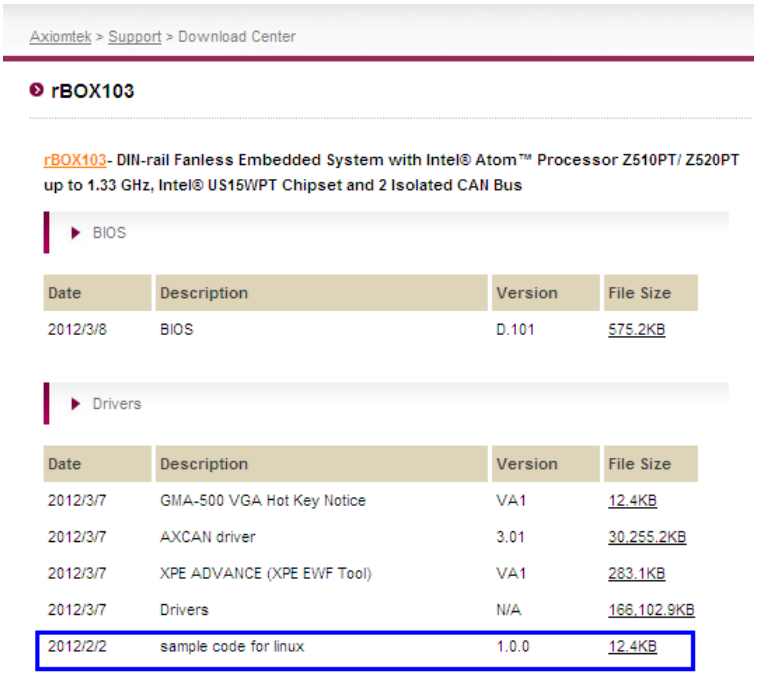


AXView Version → Sample Code → C (or C#) → AXView



➢ **Axiomtek's website for Linux :**

http://axiomtek.com/products/ViewDownload.asp?View=955



Axiomtek > Support > Download Center

rBOX103

rBOX103- DIN-rail Fanless Embedded System with Intel® Atom™ Processor Z510PT/ Z520PT up to 1.33 GHz, Intel® US15WPT Chipset and 2 Isolated CAN Bus

▶ BIOS

Date	Description	Version	File Size
2012/3/8	BIOS	D.101	575.2KB

▶ Drivers

Date	Description	Version	File Size
2012/3/7	GMA-500 VGA Hot Key Notice	VA1	12.4KB
2012/3/7	AXCAN driver	3.01	30,255.2KB
2012/3/7	XPE ADVANCE (XPE EWF Tool)	VA1	283.1KB
2012/3/7	Drivers	N/A	166,102.9KB
2012/2/2	sample code for linux	1.0.0	12.4KB

COM port interface selection Sample Code:

-Set COM port interface type (Windows, Linux)

- **Windows:**

-RS232/422/485 interface selection:

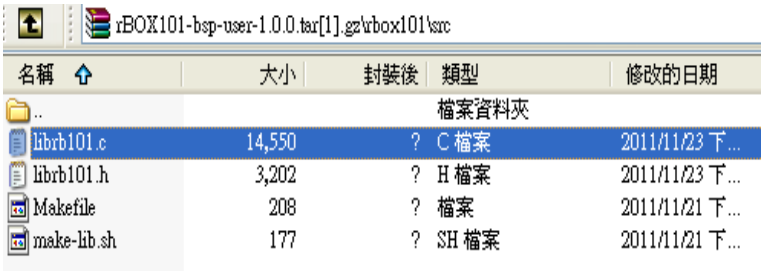
rBOX Series\rBOX101-FL\AXView Version 2.7.2\Sample code\c\AXView\SetComPort\ AXVIEW_DLL_Test.cpp

- **Linux:**

-RS232/422/485 interface selection:

\rBox103-bsp-user-1.0.0\rbox103\src\librb100.c

int _rb201_set_comport(int number, int type)



1.2.11 CANBus

■ *Feature*

- **F**ull compliance with USB 1.1/2.0 (fully speed)
- Full compliance with CAN 2.0A and CAN 2.0B
- D-sub DB9 CAN port support 2.5KV isolation
- Easily setup to CAN terminator by software configuring
- CAN transmission speed up to 1Mbps
- Provides Din-rail mounting and status LED indicators

■ *Specifications*

- **Connector**
  - 9-pin male D-Sub
- **Isolation**
  - 2.5 KVrms for DC-DC and photocoupler on CAN side
- **Receive Buffer**
  - 1000 data frames
- **NVRAM**
  - 64Kbyte (for user-defined)
- **Max Data Flow**
  - 10000 fps (CAN bus)
- **Support Protocol**
  - CAN 2.0A/2.0B
- **Terminator Resistor**
  - Software configurable
- **Baud Rate**
  - 5k,10k, 20k, 40k, 50k, 80k, 100k,125k, 200k, 250k, 400k, 500k, 600k, 800k ,1Mbps and user-defined

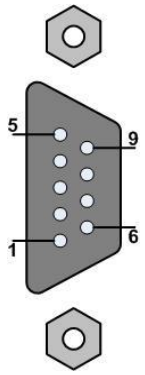
- **LED**
  - Active status, termination status

CAN No.	Color		Function
CAN 1/2	Green (CAN Act.)	Flashing	CAN is communicating
		Light off	CAN transmission is idle.
CAN1/2	Orange (CAN Termination)	Light on	CAN's terminal resistor is enabled.
		Light off	CAN's terminal resistor is disabled.

CAN Interface Connector

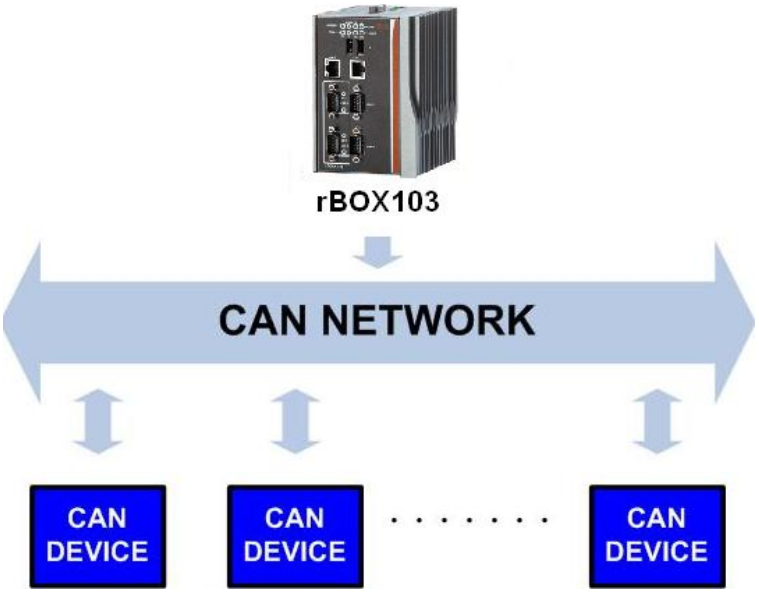
The CAN interface is a standard DB-9 connector for interfacing to CAN network.

Pin	Signal	Function
1	NC	No connect
2	CAN_L	CAN data line (Low)
3	ISOGND	Ground
4	NC	No connect
5	NC	No connect
6	ISOGND	Ground
7	CAN_H	CAN data line (High)
8	NC	No connect
9	5V (Optional)	5V (Optional)

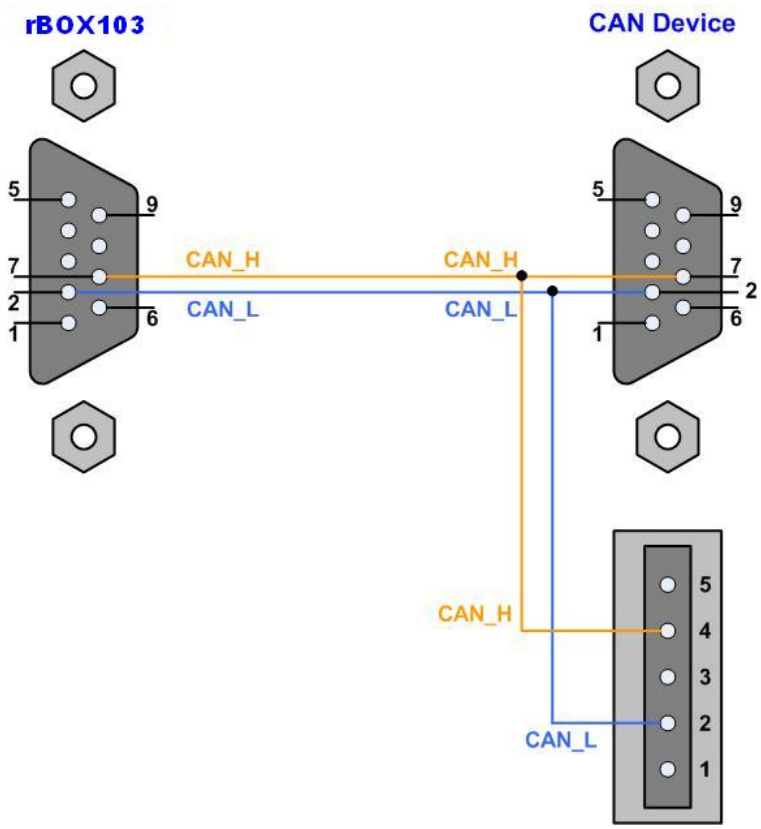


- **Hardware Connection**

The rBOX103-FL provides convenient interface for communicating with CAN devices. Below images illustrate CAN application and hardware wiring of the rBOX103-FL.



CAN Application Diagram

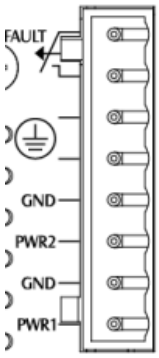


Hardware Wiring Diagram

1.2.12 Power

- 2 power paths
- 2 power sources must be same voltage and DC input range 12-48V.
- Main power source is for Input Power Path 1, Backup power source is for Input Power Path 2.
- Only one power source must be for Input Power Path 1.
- DC Input has UVP/OVP/Reverse protection.
- Reset Button without Power Switch
- DC Terminal Block

Pin	DC Signal Name
1	AL-
2	AL+
3	SG
4	SG
5	GND
6	DC2
7	GND
8	DC1



NOTE If 2 power sources aren't same voltage and the system will be possible damage.

NOTE When the system is shoutdown after, if users press the Reset Button for 3 seconds and the system will be restarted.

1.2.13 WatchDog Timer (WDT)

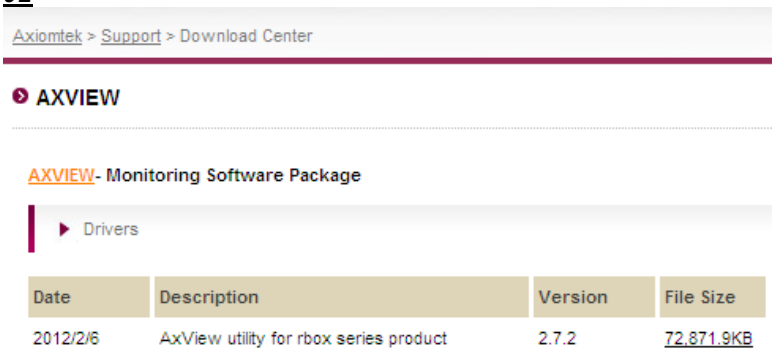
- rBox support two Watchdog timers. Those can cause system reset when timer expired.
- WDT 1 : one step is 1sec, 255 levels

  WDT 2 : one step is 250ms, 255 levels
- Some program and sample code for two Watchdog timers are offered in Windows and Linux.

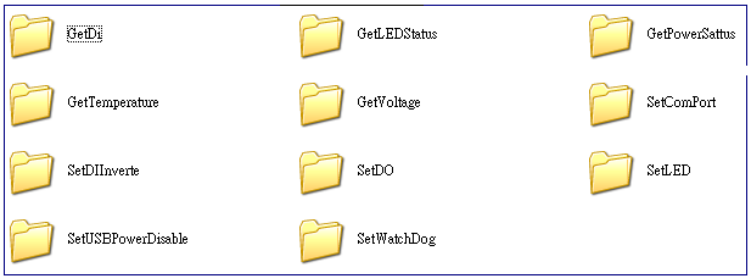
  - Windows : Please refer it from our Axiomtek AXView which on *Axiomtek's website* directly.

  - Linux : Please refer it from our *Axiomtek's website* directly.

➢ **Axiomtek's website for AXView :**
http://axiomtek.com/products/ViewDownload.asp?View=1001

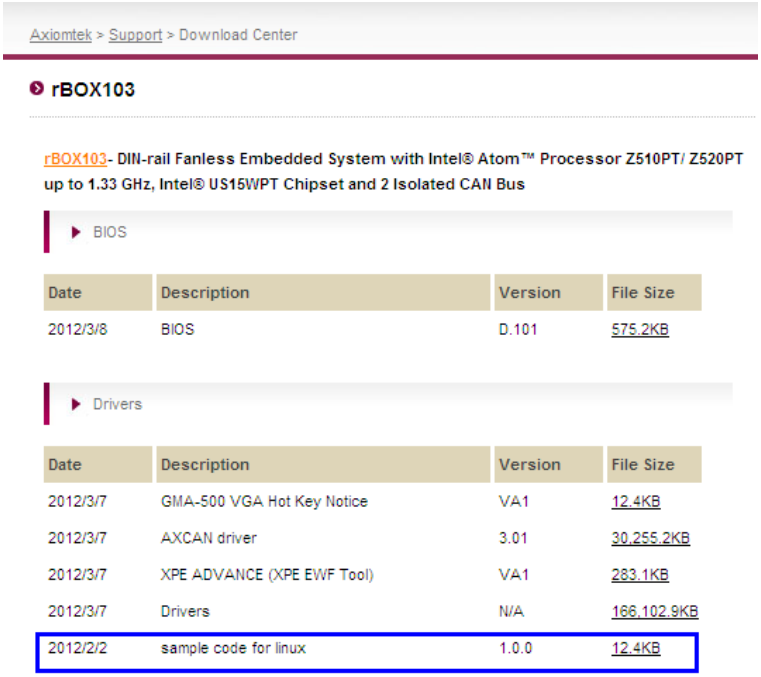


AXView Version → Sample Code → C (or C#) → AXView



- **Axiomtek's website for Linux :**

http://axiomtek.com/products/ViewDownload.asp?View=955



Axiomtek > Support > Download Center

rBOX103

rBOX103- DIN-rail Fanless Embedded System with Intel® Atom™ Processor Z510PT/ Z520PT up to 1.33 GHz, Intel® US15WPT Chipset and 2 Isolated CAN Bus

▶ BIOS

Date	Description	Version	File Size
2012/3/8	BIOS	D.101	575.2KB

▶ Drivers

Date	Description	Version	File Size
2012/3/7	GMA-500 VGA Hot Key Notice	VA1	12.4KB
2012/3/7	AXCAN driver	3.01	30,255.2KB
2012/3/7	XPE ADVANCE (XPE EWF Tool)	VA1	283.1KB
2012/3/7	Drivers	N/A	166,102.9KB
2012/2/2	sample code for linux	1.0.0	12.4KB

Watch Dog Timer Sample code:

-Super IO(Linux)

-CPLD(Windows, Linux)

- **Windows:**

-CPLD:

\rBOX101-FL\AXView Version 2.7.2\Sample code\c\AXView\SetWatchDog\ AXVIEW_DLL_Test.cpp

- **Linux:**

\rBox103-bsp-user-1.0.0\rbox103\src\librb100.c

-Super IO:

int _rm820_WDT_enable(unsigned char scale, unsigned char timeout)

int _rm820_WDT_disable(void)

int _rm820_WDT_reload(void)

int _rm820_read_WDT_config(unsigned int *time)

-CPLD:

unsigned char _rb201_get_WDT_value(void)

int _rb201_WDT_enable(unsigned char timeout)

int _rb201_WDT_disable(void)

1.2.14 System LED

For maintenance issue, IO board will have below LED.

1. DC PWR1 : Green
2. DC PWR2 : Green
3. Alarm : Red
4. OS Ready : Yellow
5. COM TX1 : Green
6. COM RX1 : Green
7. COM TX2 : Green
8. COM RX2 : Green

LED Name	Description	Color	Note
DC PWR1	Indicate the DC1 input status. When the DC input is acceptable, the LED will ON.	Green	
DC PWR2	Indicate the DC2 input status. When the DC input is acceptable, the LED will ON.	Green	
Alarm	The LED will ON if having below condition. 1. DC PWR1 or PWR2 is lost. (default) 2. User define event. The behavior of Alarm and Relay are the same. When the LED of Alarm is ON and the Relay will be turn on at the same time.	Red	

LED Name	Description	Color	Note
RDY/ACT	The LED for RDY/ACT can help users to judge BIOS finish or not and the OS can normal work or not. When the BIOS finish the configuration of system, the LED will ON. After this the LED will flash when the storage is accessed. - The LED will flash when the storage is accessed. - The LED always ON without any flash for a long time, the OS is possible crashed. - The LED isn't ON for a long time, it means the system is on shutdown status.	Yellow	
COM TX1	When COM1 transmit data the LED will on.	Green	
COM RX1	When COM1 receive data the LED will on.	Green	
COM TX2	When COM2 transmit data the LED will on.	Green	
COM RX2	When COM2 receive data the LED will on.	Green	

- CAN LED (Active status, termination status)

CAN No.	Color		Function
CAN 1/2	Green (CAN Act.)	Flashing	CAN is communicating
		Light off	CAN transmission is idle.
CAN1/2	Orange (CAN Termination)	Light on	CAN's terminal resistor is enabled.
		Light off	CAN's terminal resistor is disabled.

NOTE **When *the system is shoutdown after, if users press the Reset Button for 3 seconds and the system will be restarded.***

- Some program and sample code for Alarm LED and Relay Output are offered in Windows and Linux.

  - Windows : Please refer it from our Axiomtek AXView which on *Axiomtek's website* directly.

  - Linux : Please refer it from our *Axiomtek's website* directly.

- Alarm LED and Relay output Sample Code:

  - Set Alarm LED and Relay status(Windows, Linux)

  - Get Alarm LED and Relay status(Windows, Linux)

  - Get Power status(Windows, Linux)

- **Windows:**

-Get the LED status:

rBOX101-FL\AXView Version 2.7.2\Sample code\c\AXView\GetLEDStatus\AXVIEW_DLL_Test.cpp

-Set the LED status:

rBOX101-FL\AXView Version 2.7.2\Sample code\c\AXView\SetLED\AXVIEW_DLL_Test.cpp

-Get Power Status:

rBOX101-FL\AXView Version 2.7.2\Sample code\c\AXView\GetPowerSattus\ AXVIEW_DLL_Test.cpp

- **Linux:**

\rBox103-bsp-user-1.0.0\rbox103\src\librb100.c

-Get the LED status:

int _rb201_get_power_usr_alarm_status(void)

-Set the LED status:

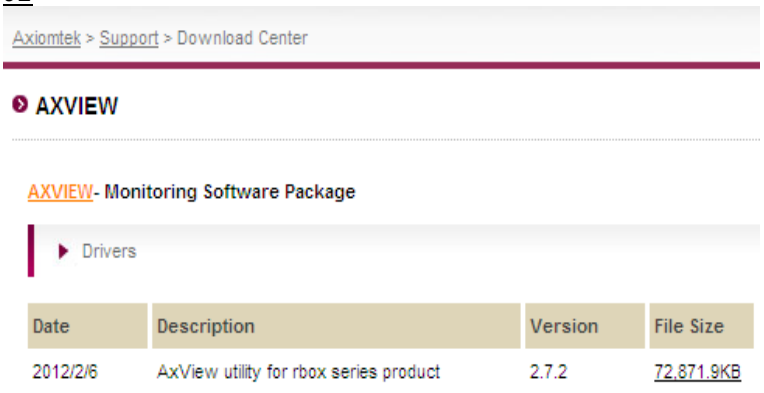
int _rb201_power_alarm_ctl(int onoff)

-Get Power Status:

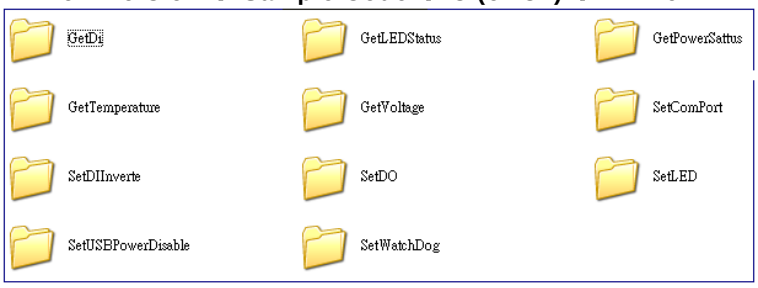
int _rb201_read_power_status(int number)

- **Axiomtek's website for AXView :**

http://axiomtek.com/products/ViewDownload.asp?View=1001

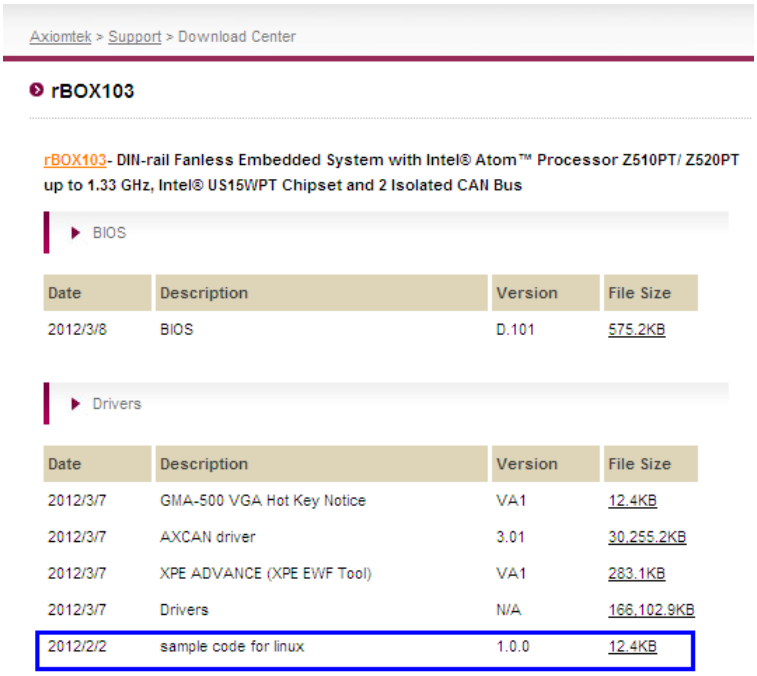


AXView Version → Sample Code → C (or C#) → AXView



- **Axiomtek's website for Linux :**

http://axiomtek.com/products/ViewDownload.asp?View=955



Axiomtek > Support > Download Center

rBOX103

rBOX103- DIN-rail Fanless Embedded System with Intel® Atom™ Processor Z510PT/ Z520PT up to 1.33 GHz, Intel® US15WPT Chipset and 2 Isolated CAN Bus

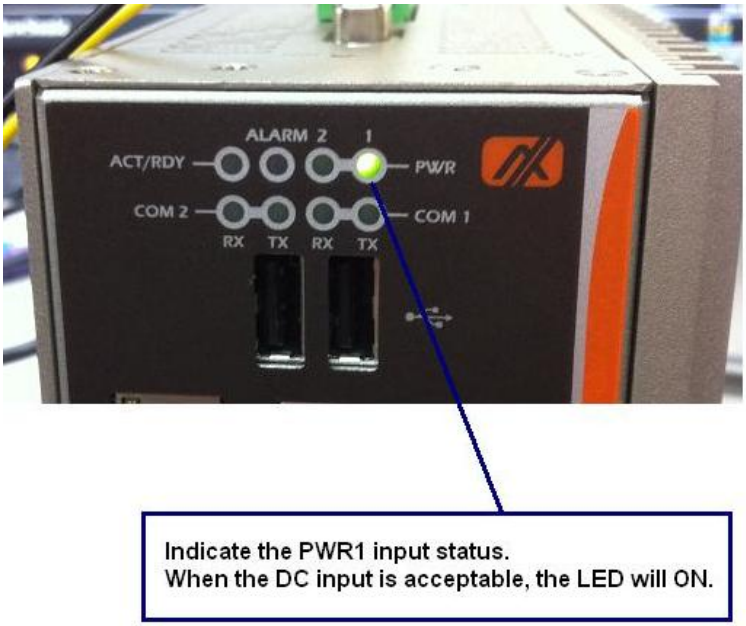
▶ BIOS

Date	Description	Version	File Size
2012/3/8	BIOS	D.101	575.2KB

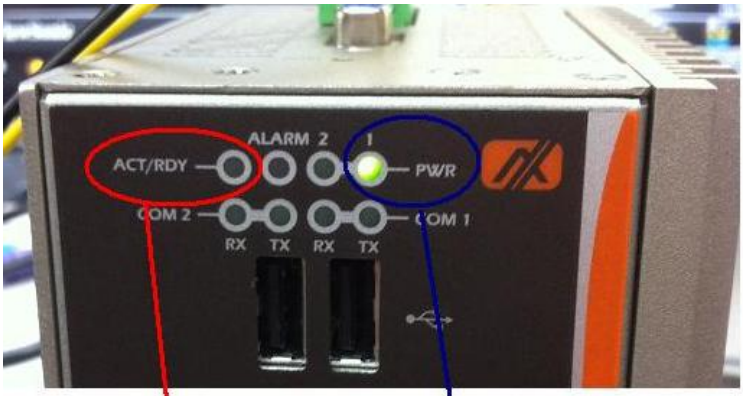
▶ Drivers

Date	Description	Version	File Size
2012/3/7	GMA-500 VGA Hot Key Notice	VA1	12.4KB
2012/3/7	AXCAN driver	3.01	30,255.2KB
2012/3/7	XPE ADVANCE (XPE EWF Tool)	VA1	283.1KB
2012/3/7	Drivers	N/A	166,102.9KB
2012/2/2	sample code for linux	1.0.0	12.4KB

Below pictures are the LED example:



The LED will ON if having below condition.
1. DC PWR1 or PWR2 is lost. (default)
2. User define event.
The behavior of Alarm and Relay are the same.
When the LED of Alarm is ON and the Relay will be turn on at the same time.



Because the PWR1 is still linked, so, the LED of PWR1 is still ON.

When the system is shut down, the LED of ACT/RDY will not ON.

When the BIOS finish the configuration of system, the LED of ACT/RDY will ON.
After the LED of ACT/RDY will flash when the storage is accessed.

1.2.15 Alarm Contact

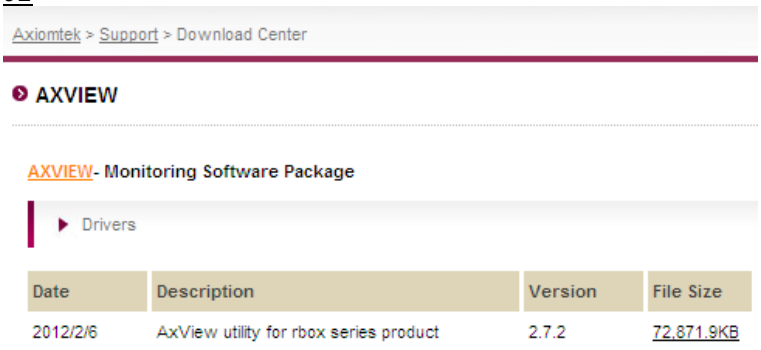
- The rBOX can support two DC power source. When lost one of them will cause Alarm LED on and trigger Relay out for remote notice.
- We also provide the register for user to define their event for trigger the Alarm LED and Relay. Alarm LED and Relay output have the same activity depend on DC status and register control.
- 1 relay output
- Relay output with 0.5A @ 30VDC
- Event : Power Fail and User define
- Some program and sample code for Alarm LED and Relay Output are offered in Windows and Linux.

  - Windows : Please refer it from our Axiomtek AXView which on *Axiomtek's website* directly.

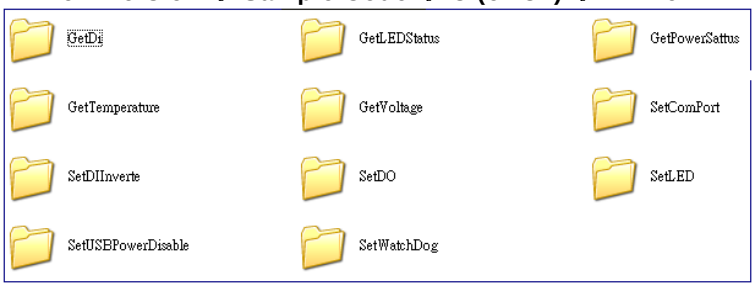
  - Linux : Please refer it from our *Axiomtek's website* directly.

- **Axiomtek's website for AXView :**

http://axiomtek.com/products/ViewDownload.asp?View=1001

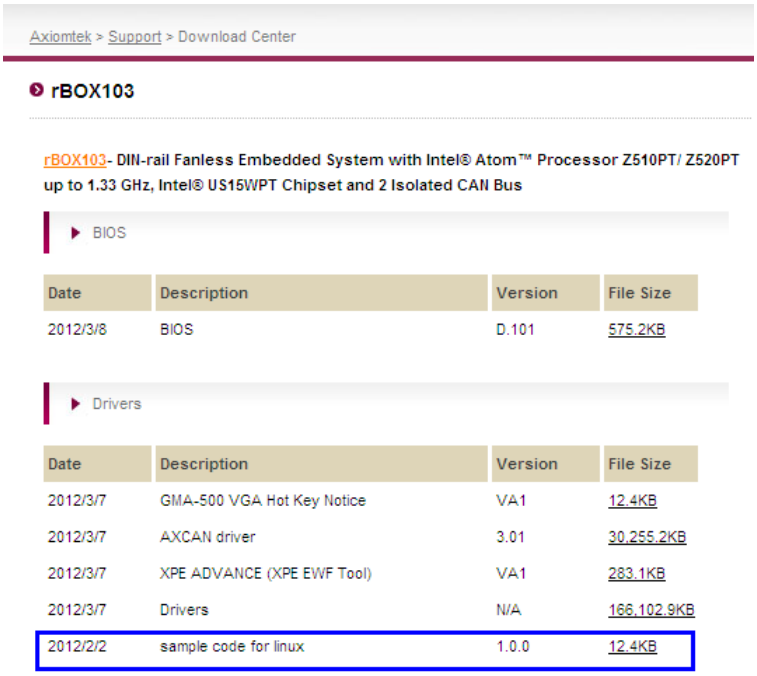


AXView Version → Sample Code → C (or C#) → AXView



- **Axiomtek's website for Linux :**

http://axiomtek.com/products/ViewDownload.asp?View=955



Axiomtek > Support > Download Center

rBOX103

rBOX103- DIN-rail Fanless Embedded System with Intel® Atom™ Processor Z510PT/ Z520PT up to 1.33 GHz, Intel® US15WPT Chipset and 2 Isolated CAN Bus

▶ BIOS

Date	Description	Version	File Size
2012/3/8	BIOS	D.101	575.2KB

▶ Drivers

Date	Description	Version	File Size
2012/3/7	GMA-500 VGA Hot Key Notice	VA1	12.4KB
2012/3/7	AXCAN driver	3.01	30,255.2KB
2012/3/7	XPE ADVANCE (XPE EWF Tool)	VA1	283.1KB
2012/3/7	Drivers	N/A	166,102.9KB
2012/2/2	sample code for linux	1.0.0	12.4KB

Alarm LED and Relay output Sample Code:

- Set Alarm LED and Relay status(Windows, Linux)
- Get Alarm LED and Relay status(Windows, Linux)
- Get Power status(Windows, Linux)

- **Windows:**

-Get the LED status:

rBOX101-FL\AXView Version 2.7.2\Sample code\c\AXView\GetLEDStatus\AXVIEW_DLL_Test.cpp

-Set the LED status:

rBOX101-FL\AXView Version 2.7.2\Sample code\c\AXView\SetLED\AXVIEW_DLL_Test.cpp

-Get Power Status:

rBOX101-FL\AXView Version 2.7.2\Sample code\c\AXView\GetPowerSattus\ AXVIEW_DLL_Test.cpp

- Linux :

-Get the LED status:

int _rb201_get_power_usr_alarm_status(void)

-Set the LED status:

int _rb201_power_alarm_ctl(int onoff)

-Get Power Status:

int _rb201_read_power_status(int number)

- **rBOX Alarm Application:**

Troubleshooting is very important in many applications.

In the rBox series we can provide three kinds of way for troubleshooting.

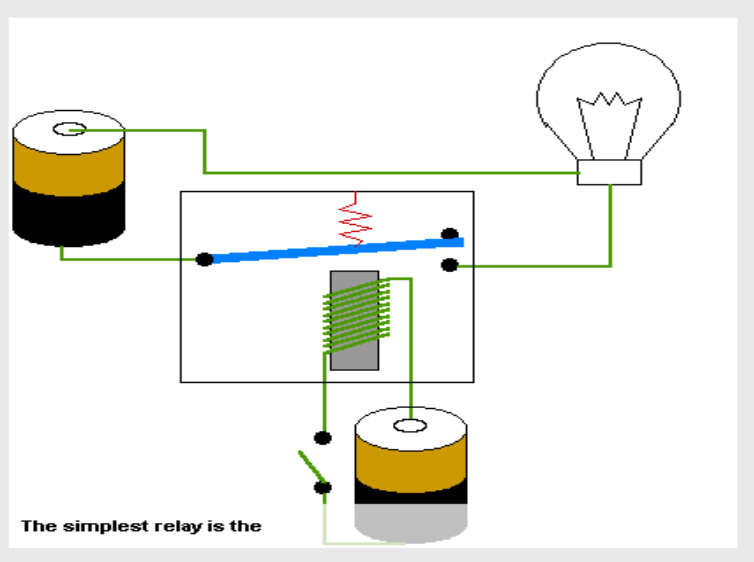
- Alarm LED
- Relay out
- SNMP through AXView

1. Maintenance Staff can check the Alarm LED for basic troubleshooting.

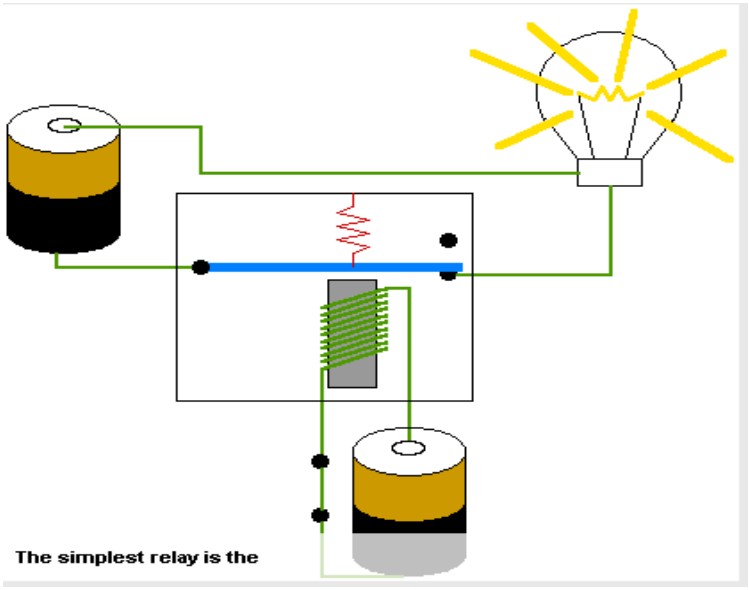
2. Relay output

   Below is a very simple application for remote notice use relay and lamp.

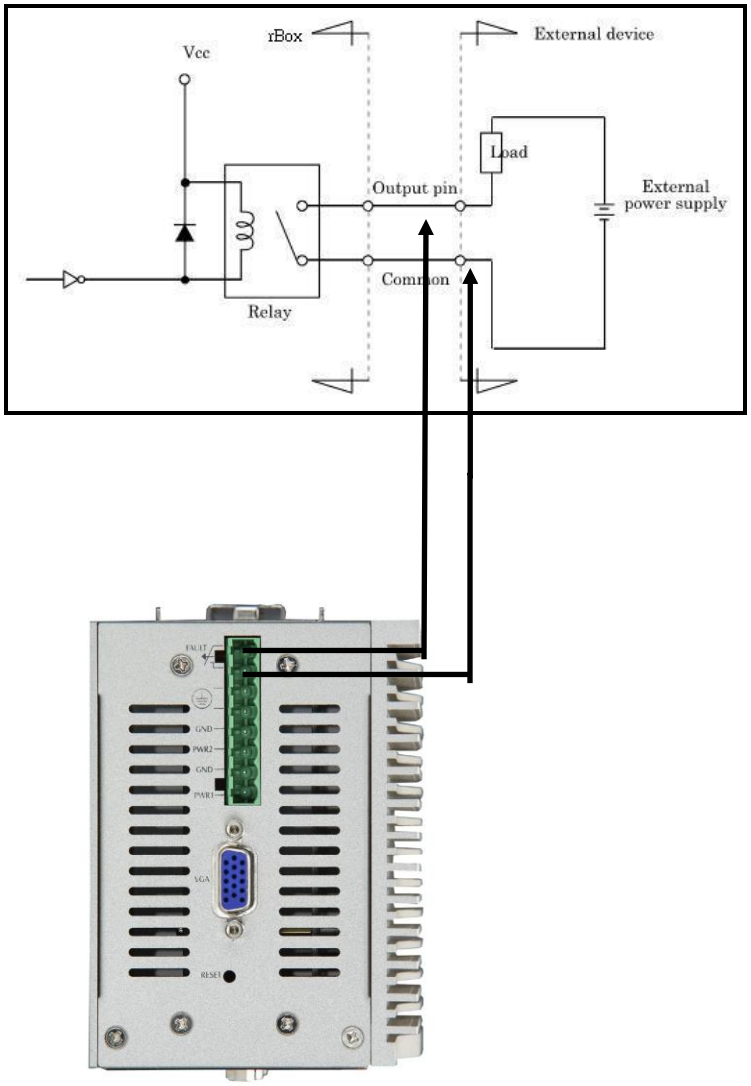
   a) Normal



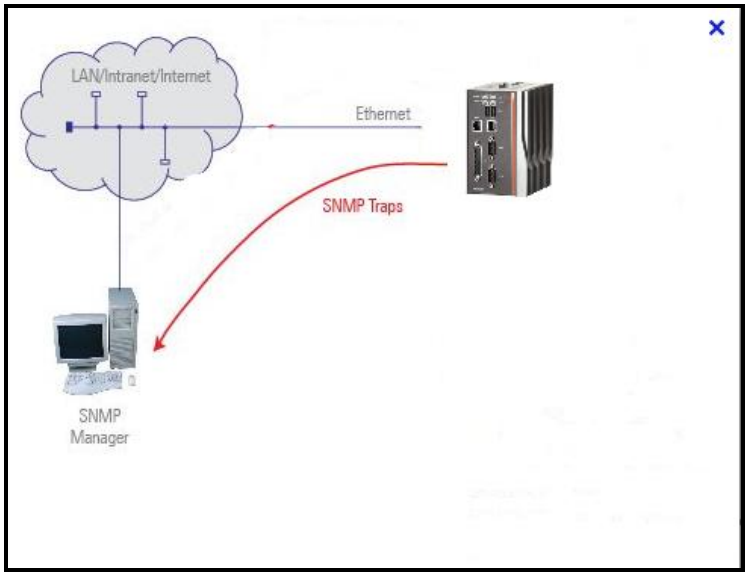
b) Warning



c) Relay wiring of rBox



3. SNMP



1.2.16 Wireless (3G, GPRS)

- 1 x Mini Card (Support USB only)
- 1 x SIM Socket on board

1.2.17 Reset Bottom

- 1 x Reset bottom

NOTE When the system is shoutdown after, if users press the Reset Button for 3 seconds and the system will be restarted.

1.2.18 Operation Temperature

- -40℃ ~ +70℃ (-40 ºF ~ +158ºF), with W.T. (Memory & CF)

1.2.19 Storage Temperature

- -45℃ ~ +85℃ (-49 ºF ~ +185ºF)

1.2.20 Humidity

- 5% ~ 95% (non-condensation)

1.2.21 Weight

- 1.38 kg (3 lb) for rBOX101-4COM

1.2.22 Dimensions

- 81mm(3.18") (W) x110mm(4.33") (D) x135mm(5.31") (H)

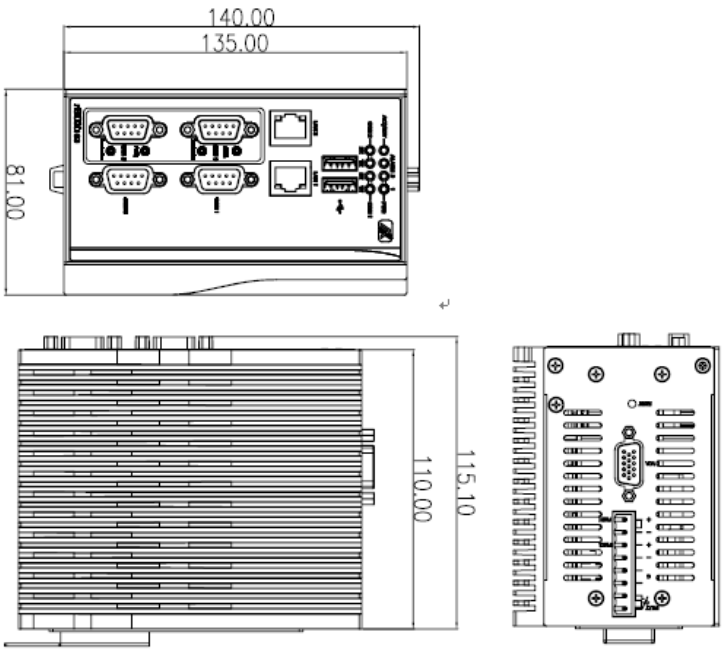
1.2.23 System I/O Outlet

- Two 9-pin D-Sub male connectors, COM1/COM2 for RS-232/422/485
- One 15-pin D-Sub female connector for VGA
- One 10/100/1000Mbps Ethernet with Magnetic Isolation Protection & one 10/100Mbps Ethernet with Magnetic Isolation Protection
- Two USB 2.0 connectors
- Two isolated CAN 2.0 A/B connectors
- Two DC Powers Input with terminal block
- Alarm Contact
- Wireless (3G or GPRS)

NOTE ***All specifications and images are subject to change without notice.***

1.3 Dimensions

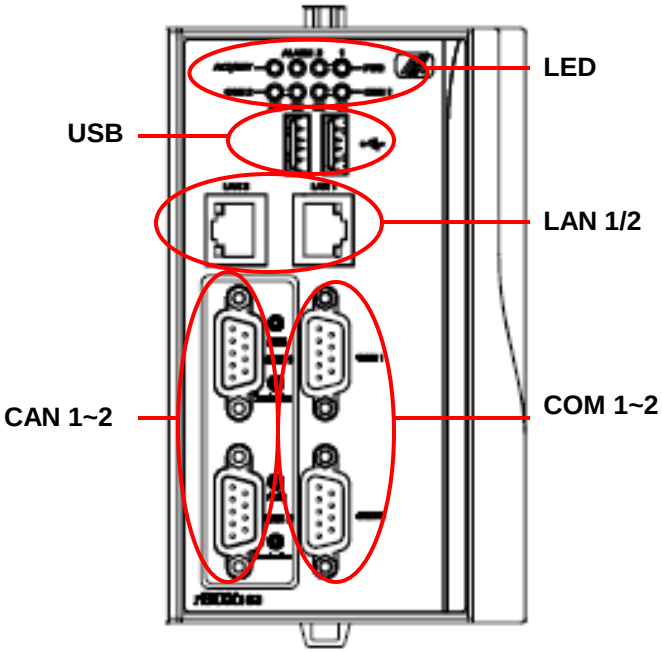
The following diagrams show you dimensions and outlines of the rBOX103-FL



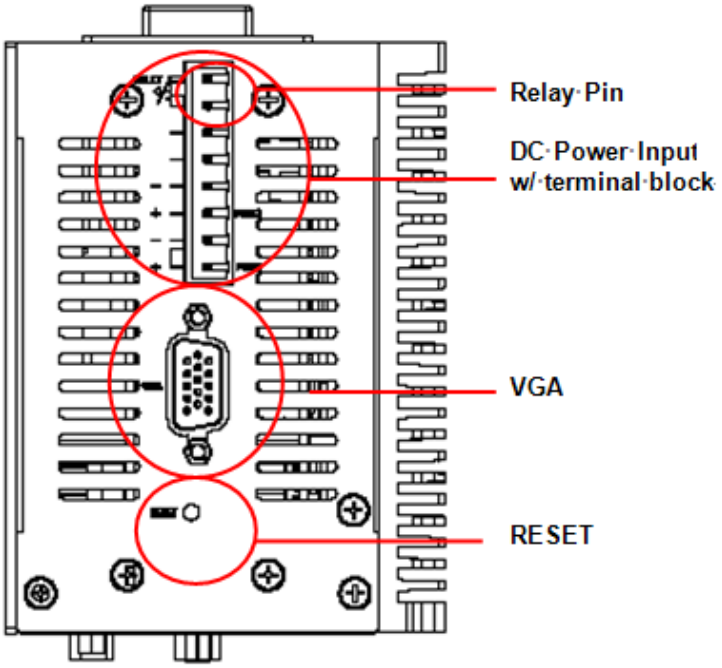
1.4 I/O Outlets

The following figures show you I/O outlets on front view and top view of the rBOX103--FL

- **Front View**



- **Top View**



1.5 Packing List

The package bundled with your rBOX103-FL should contain the following items:

- rBOX103-FL System Unit x 1
- CD x 1 (For Driver and User's Manual)
- Power terminal block x1
- Din-rail kit x1
- Screws
- Quick Manual x1

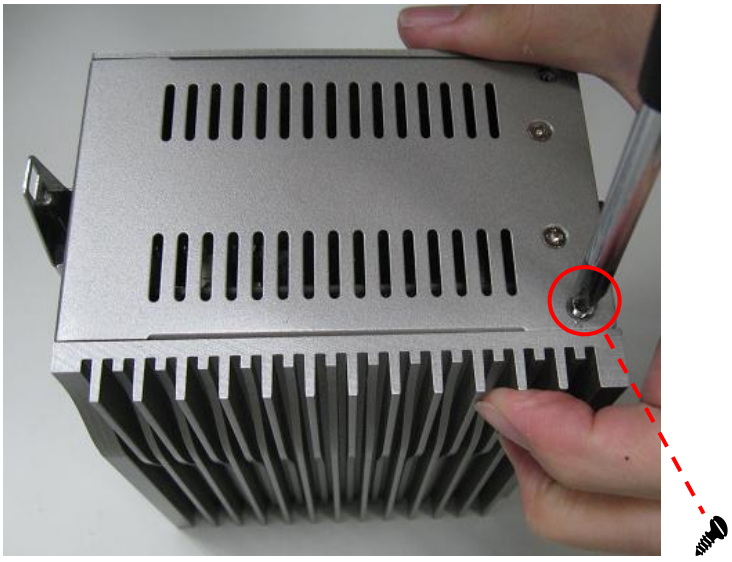
CHAPTER 2
HARDWARE INSTALLATION

The rBOX103-FL is convenient for your various hardware configurations, such as Memory Module and CompactFlash™ card. The chapter 2 will show you how to install the hardware. It includes:

2.1 Installing the Memory Module

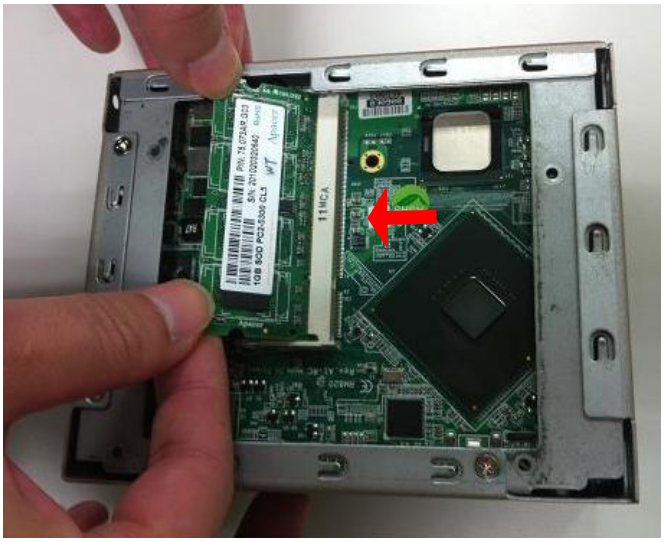
Step 1 Turn off the system.

Step 2 Loosen these screws, and remove the top cover from the system.



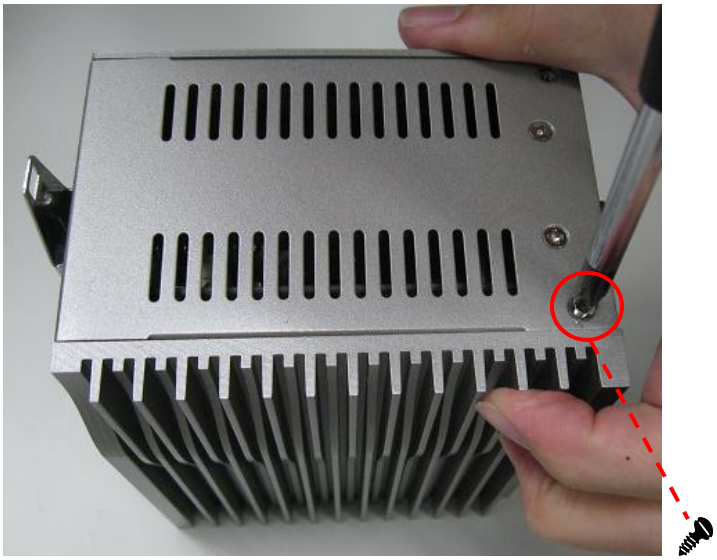
rBOX103

Step 3 Hold one side of the module, and insert the gold colored contact into the socket. Push the module down.



Step 4 The memory module is locked by two latches on the sides.

Step 5 Put the cover back to the system, and fasten screws tight close the chassis.



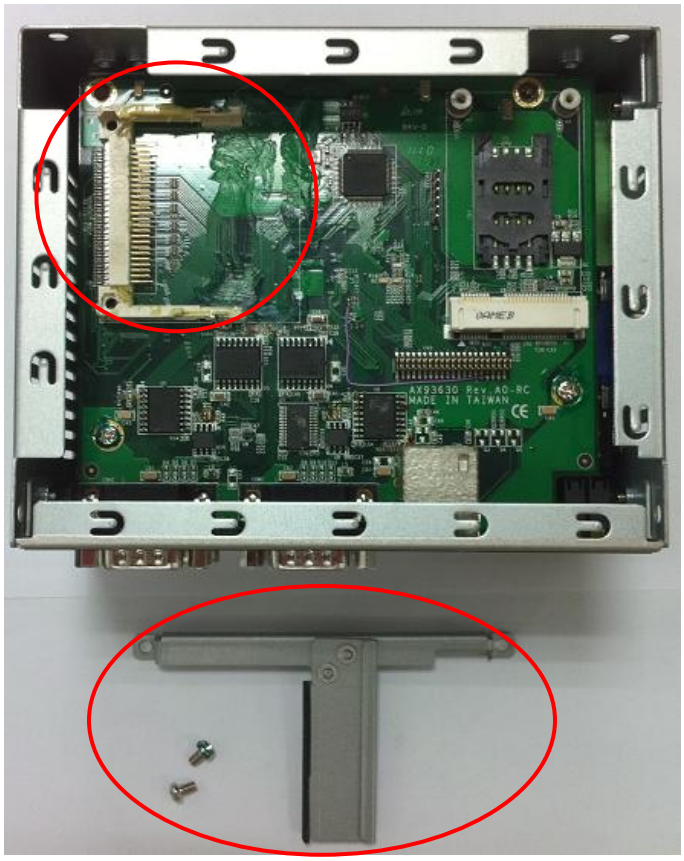
2.2 Installing the CompactFlashTM Card

Step 1 Turn off the system.

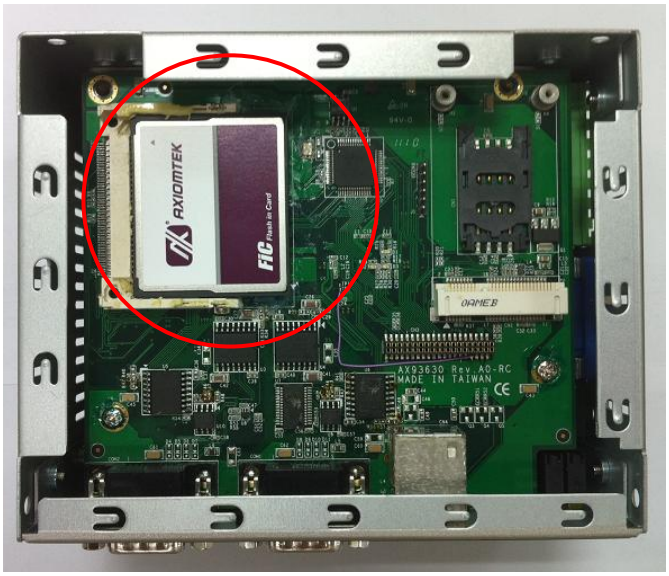
Step 2 Loosen these screws, and remove the cover from the system.

Step 3 Locate the CompactFlash™ socket.

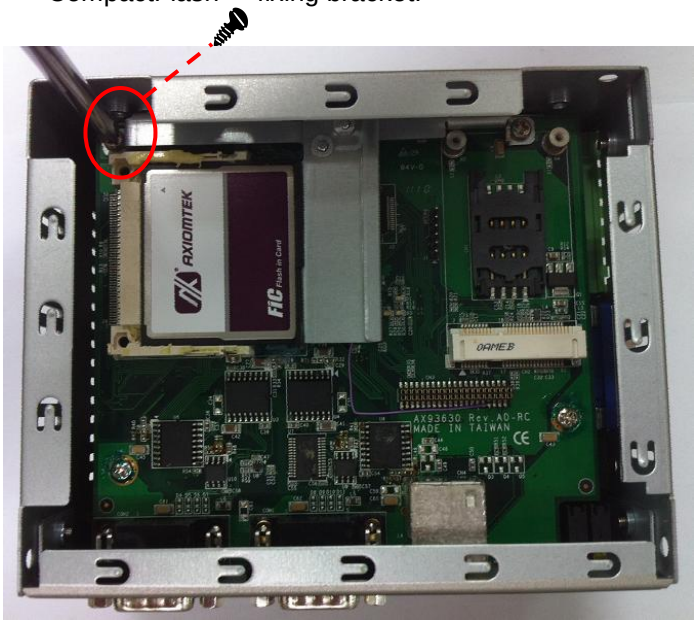
Step 4 Loosen these screws and remove the CompactFlash™ fixing bracket.



Step 5 Insert the CompactFlash™ card into the socket until it is firmly seated.



Step 6 Put the CompactFlash™ fixing bracket back to the system, and fasten screws tight close the CompactFlash™ fixing bracket.

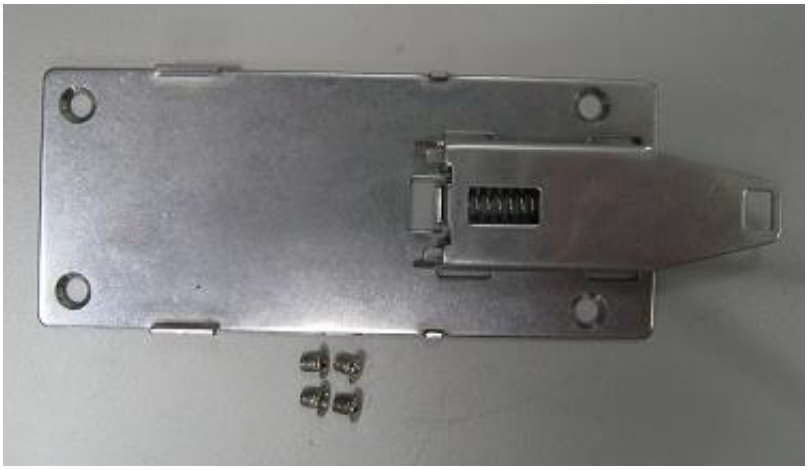


Step 7 Put the cover back to the system, and fasten screws tight close the chassis.

2.2.1 Installing Din-rail Mounting

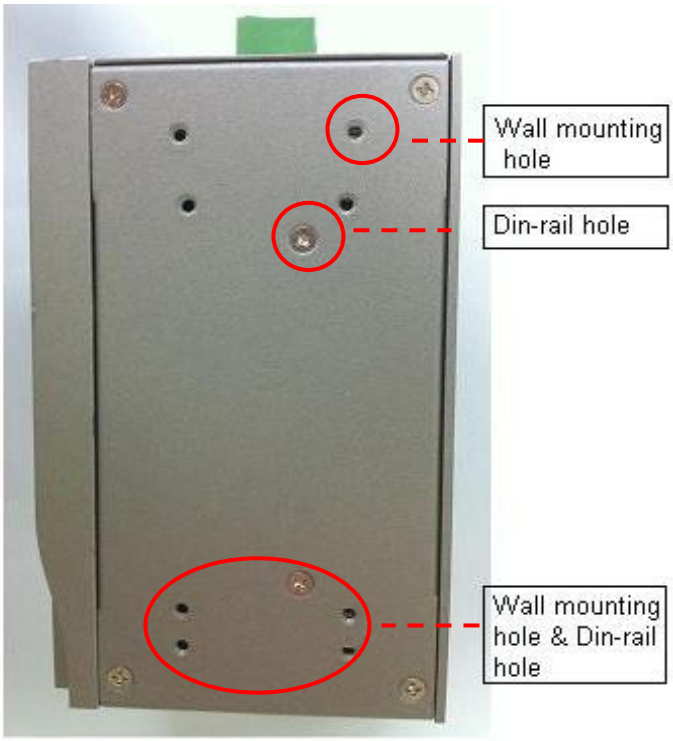
The rBOX103-FL provides Din-rail Mount that customers can install as below:

Step 1 Prepare DIN Mount assembling components (screws and bracket) ready.

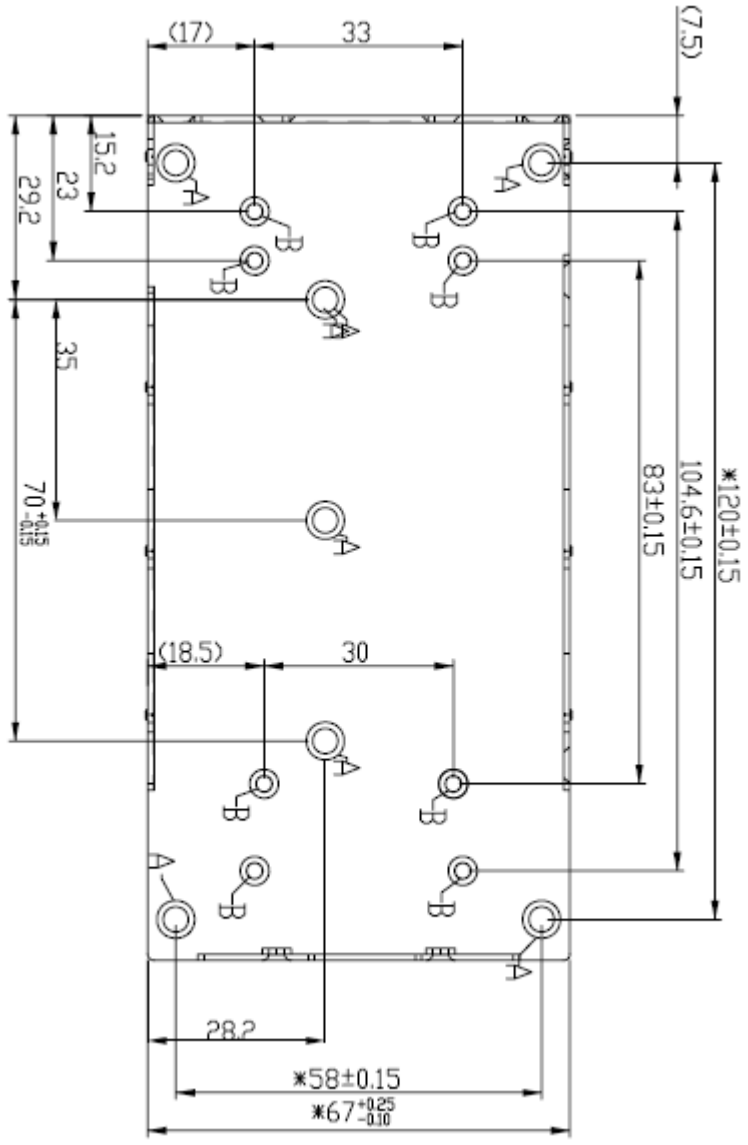


Step 2 Assembly the bracket to the system, and fasten screws tight.

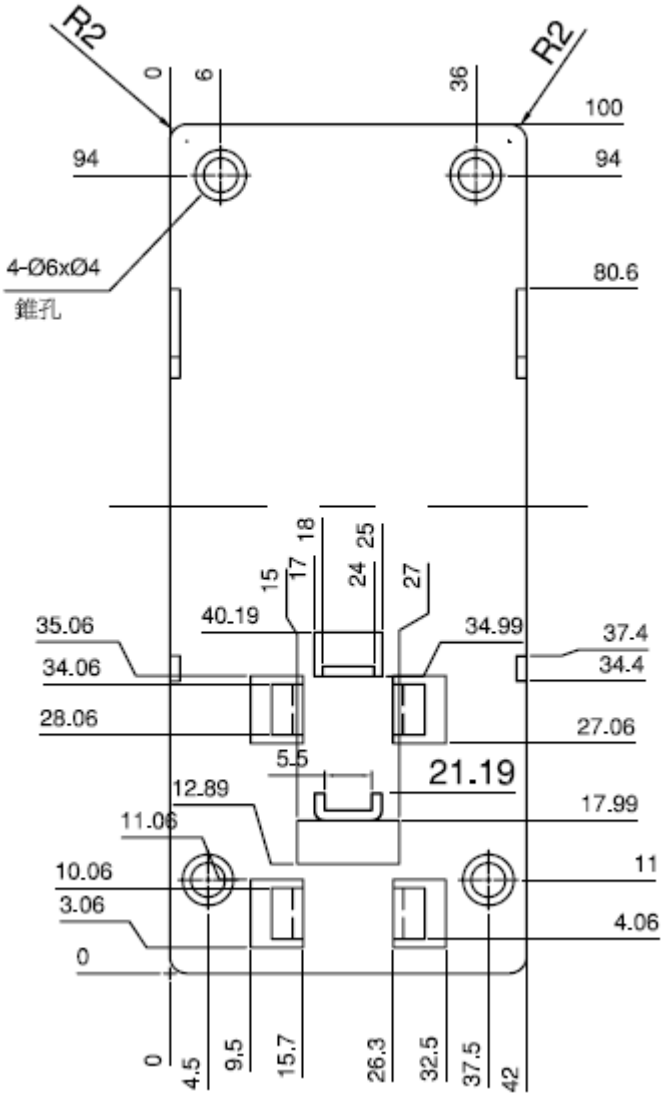
NOTE ***Please notice the Din-rail holes with Wall-mounting holes while assembly the bracket to system.***

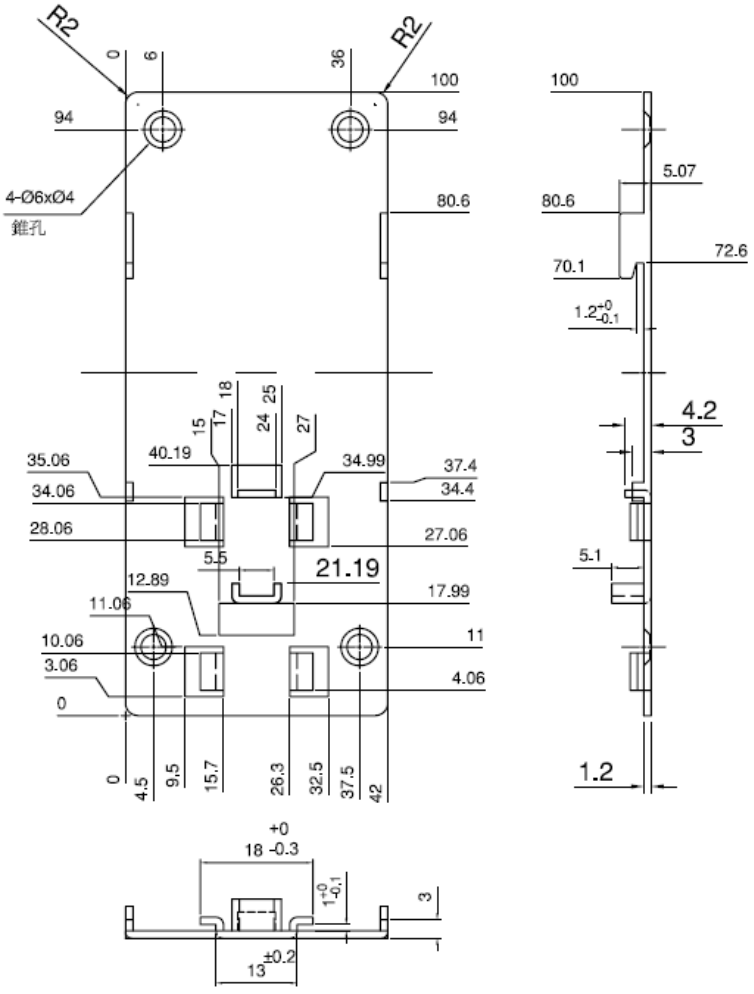


NOTE ***The Din-rail hole drawing for rBOX103-FL is listed below:***



NOTE ***The Din-rail kit drawing is listed below:***

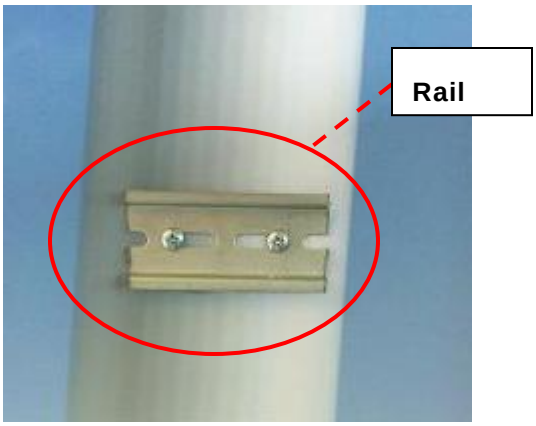



R2
R2
0
6
36
100
94
94
4-Ø6xØ4
錐孔
80.6
18
25
15
17
24
27
40.19
34.99
35.06
34.06
28.06
37.4
34.4
27.06
5.5
21.19
12.89
11.06
17.99
10.06
11
3.06
4.06
0
0
4.5
9.5
15.7
26.3
32.5
37.5
42
18 +0 -0.3
1 +0 -0.1
3
13 ±0.2
100
5.07
80.6
72.6
70.1
1.2 +0 -0.1
4.2
3
5.1
1.2

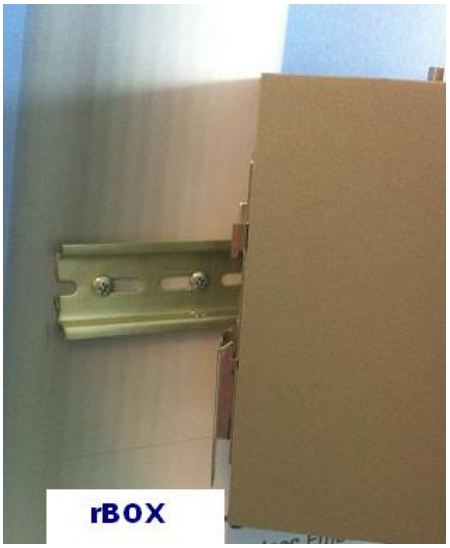
2.2.2 Setting up rBOX by Din-rail mounting

The rBOX103-FL set up by Din-rail mounting as below:

Step 1 Fixing the rail firstly.



Step 2 Set up the rBOX103-FL on the rail by Din-rail mounting

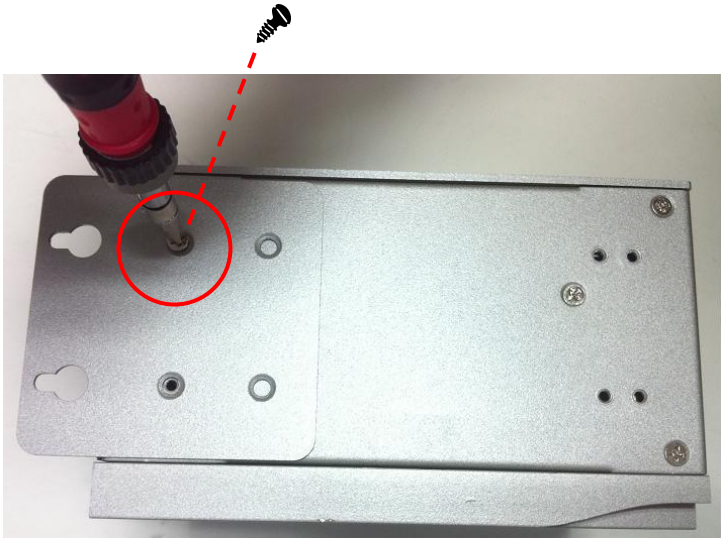

rBOX

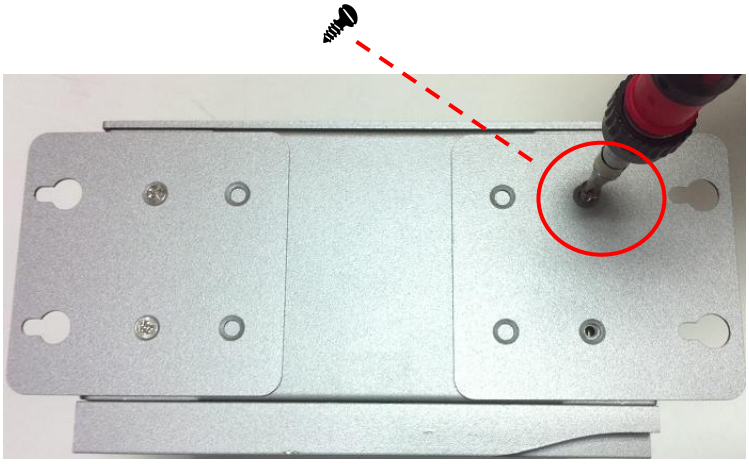
2.3 Installing Wall Mounting (optional)

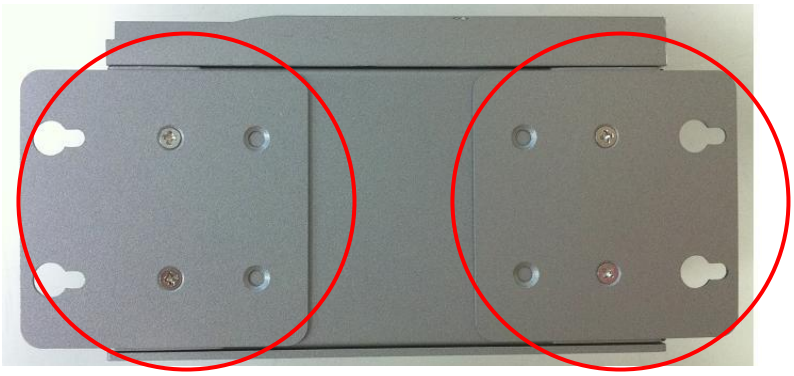
The rBOX103-FL provides Wall Mounting that customers can install as below:

Step 1 Prepare Wall Mount assembling components (screws and bracket) ready.

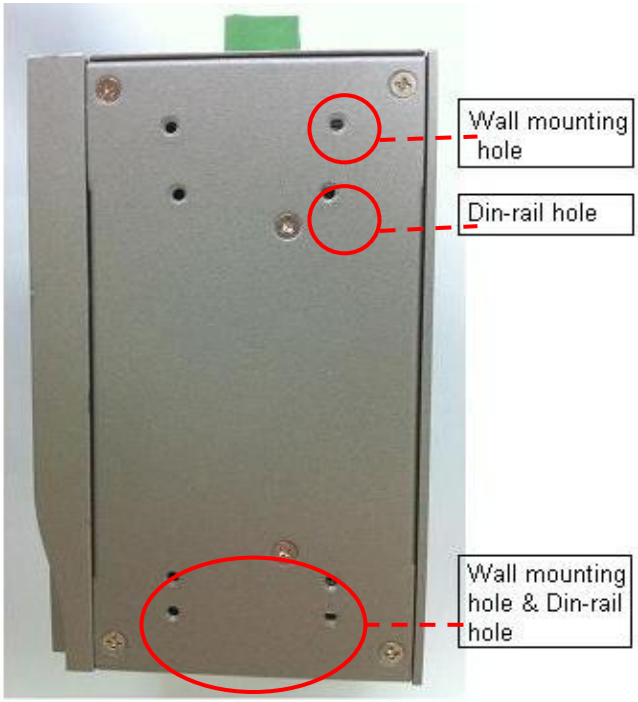
Step 2 Assembly the bracket to the system, and fasten screws tight.







NOTE ***Please notice the Din-rail holes with Wall-mounting holes while assembly the bracket to system.***



MEMO:

CHAPTER 3
PHOENIX-AWARD BIOS UTILITY

The Phoenix-Award BIOS provides users with a built-in Setup program to modify basic system configuration. All configured parameters are stored in a flash-backed-up to save the Setup information whenever the power is turned off.

3.1 Entering Setup

There is one way to enter the Setup program. You may either turn ON the computer and press <Del> immediately.

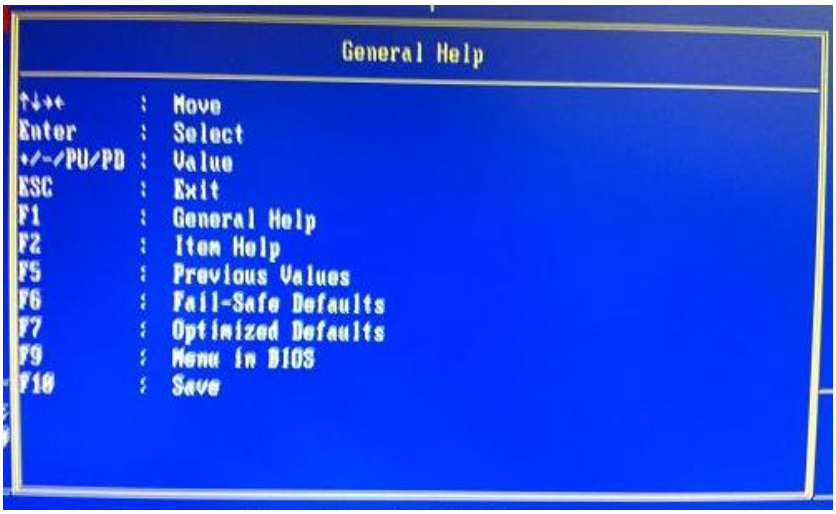
3.2 Control Keys

Up arrow	Move to the previous item
Down arrow	Move to the next item
Left arrow	Move to the left side
Right arrow	Move to the right side
Esc key	Main Menu -- Quit and delete changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
PgUp/"+"key	Increase the numeric value or make changes
PgDn/"–" key	Decrease the numeric value or make changes
F6 key	Load the default CMOS value from BIOS default table, only for Option Page Setup Menu
F7 key	Load the Setup default, only for Option Page Setup Menu
F10 key	Save all the CMOS changes, only for Main Menu

3.3 Getting Help

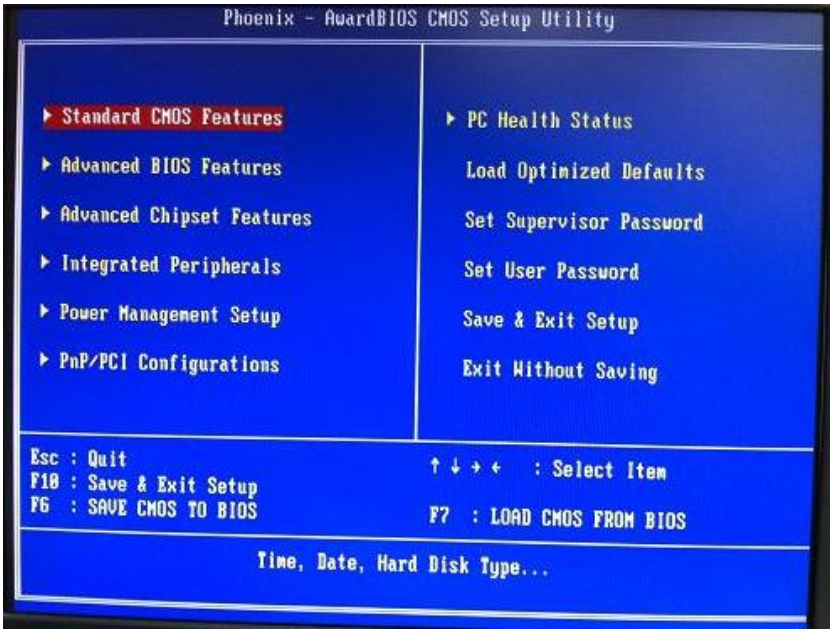
Main Menu The online description of the highlighted setup function is displayed at the bottom of the screen.

Status Page Setup Menu/Option Page Setup Menu Press <F1> to pop out a General Help Window that provides the description of using appropriate keys and possible selections for highlighted items.
Press <Esc> to exit the Help Window.



3.4 The Main Menu

Once you enter the Award BIOS CMOS Setup Utility, the Main Menu appears on the screen. In the Main Menu, there are several Setup functions and a couple of Exit options for your selection. Use arrow keys to select the Setup Page you intend to configure then press <Enter> to accept or enter its sub-menu.

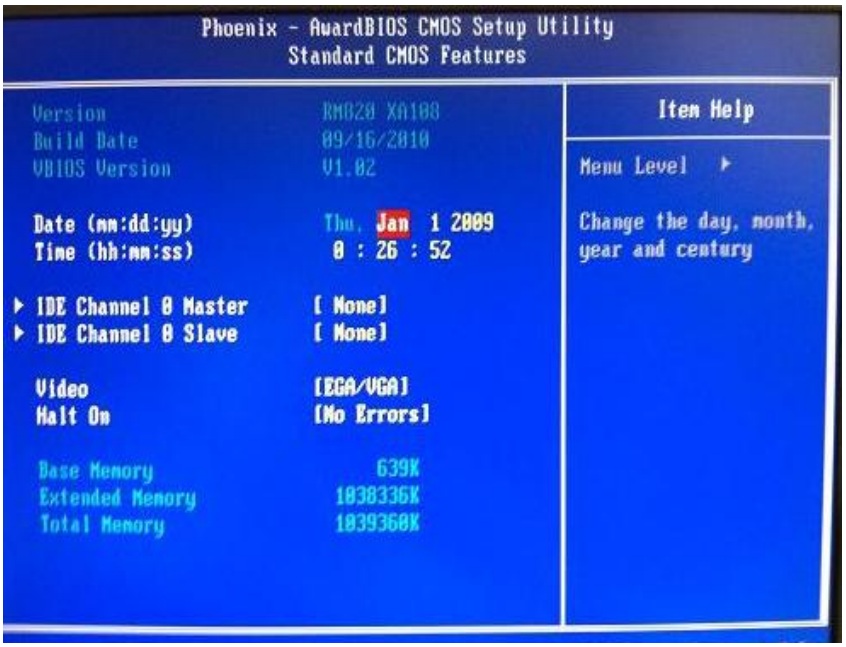


NOTE ***If your computer can not boot after making and saving system changes with Setup, the Award BIOS will reset your system to the CMOS default settings via its built-in override feature.***

NOTE ***It is strongly recommended that you should avoid changing the chipset's defaults. Both Award and your system manufacturer have carefully set up these defaults that provide the best performance and reliability.***

3.5 Standard CMOS Setup Menu

The Standard CMOS Setup Menu displays basic information about your system. Use arrow keys to highlight each item, and use <PgUp> or <PgDn> key to select the value you want in each item.

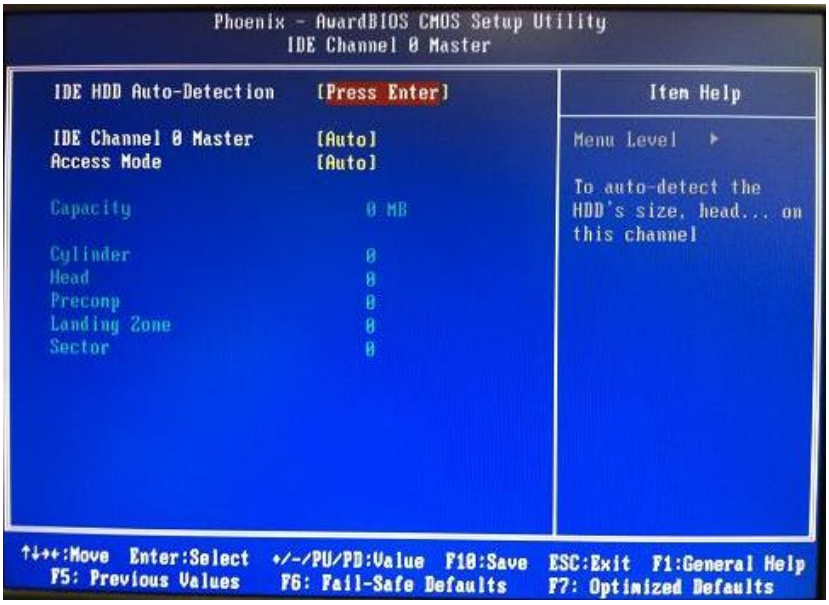


- **Date**
  The date format is <day> <month> <date> <year>.
- **Time**
  This item shows current time of your system with the format <hour> <minute> <second>. The time is calculated based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

NOTE If system is power failure, the date and time will come back to previous setup.

- **IDE Primary Master/Primary Slave**

These items identify the types of each IDE channel installed in the computer, so, IDE type is auto detection.


Phoenix - AwardBIOS CMOS Setup Utility
IDE Channel 0 Master
IDE HDD Auto-Detection [Press Enter]
IDE Channel 0 Master [Auto]
Access Mode [Auto]
Capacity 0 MB
Cylinder 0
Head 0
Precomp 0
Landing Zone 0
Sector 0
Item Help
Menu Level ▸
To auto-detect the HDD's size, head... on this channel
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

- **Video**
  Select the display adapter type for your system.

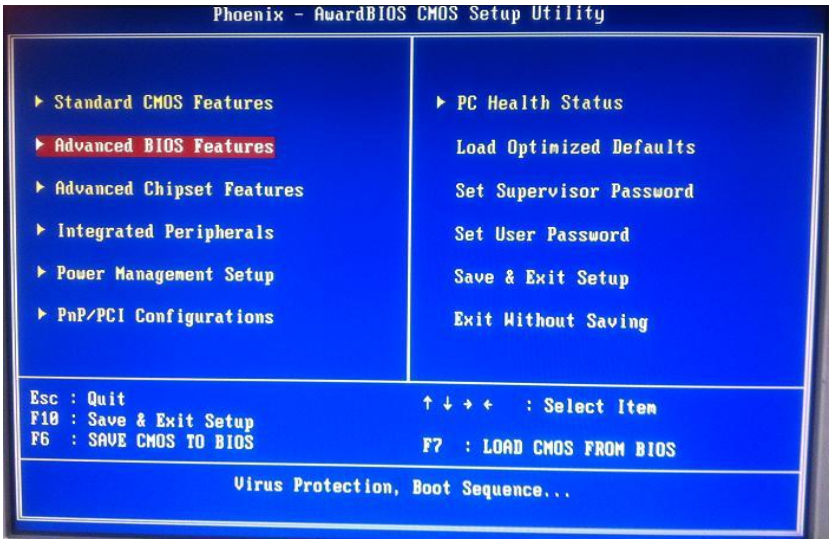
- **Halt On**
  This item determines whether the system will halt or not, if an error is detected while powering up.

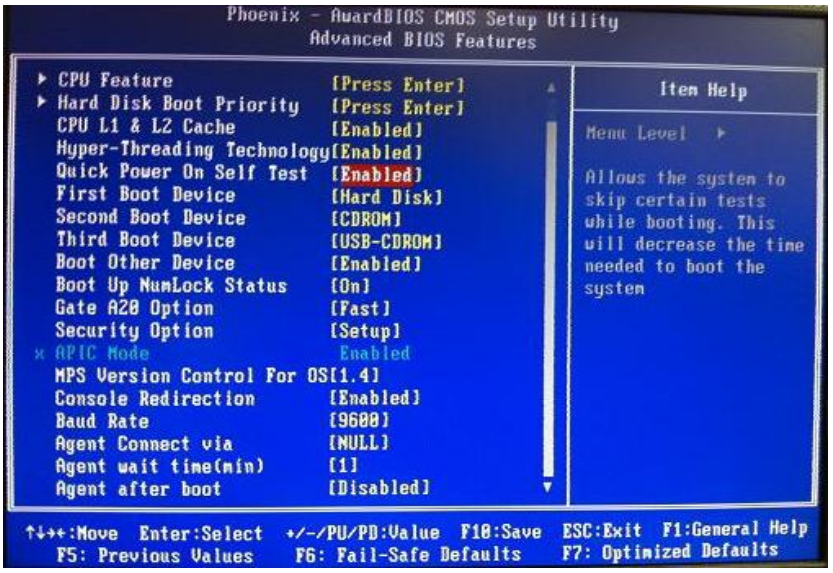
No errors	The system booting will halt on any errors detected. (default)
All errors	Whenever BIOS detects a non-fatal error, the system will stop and you will be prompted.
All, But Keyboard	The system booting will not stop for a keyboard error; it will stop for other errors.

- Press <Esc> to return to the Main Menu page. USB Device Setting

3.6 Advanced BIOS Features

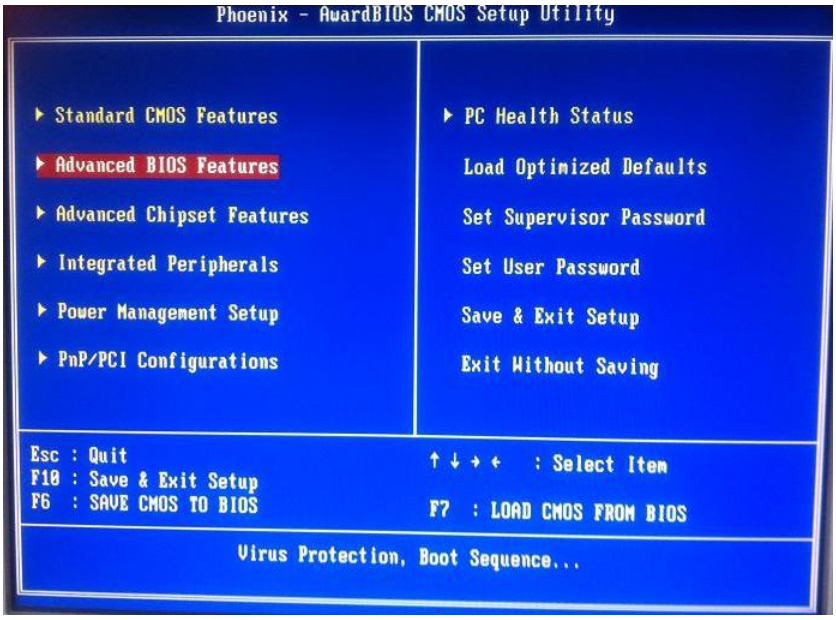
This section allows you to configure and improve your system, to set up some system features according to your preference.



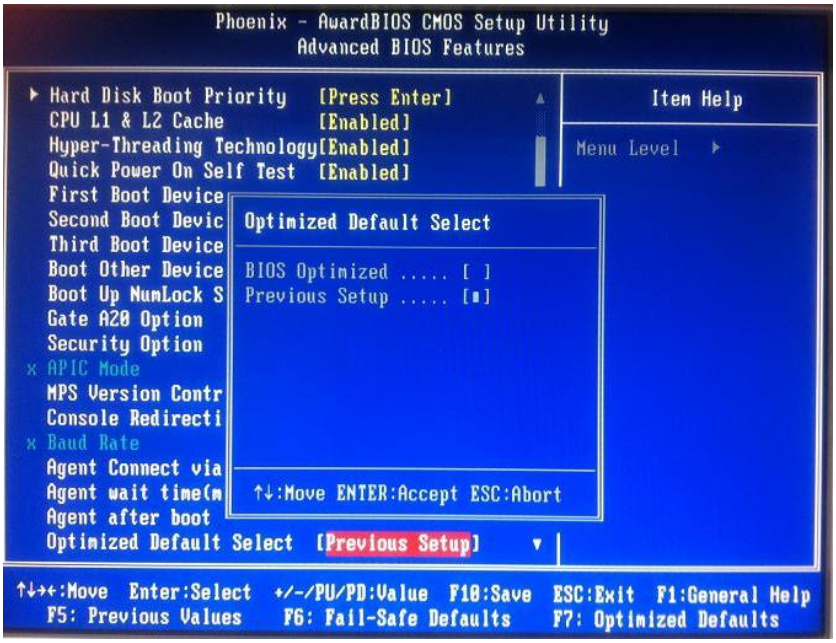

Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features
CPU Feature [Press Enter]
Hard Disk Boot Priority [Press Enter]
CPU L1 & L2 Cache [Enabled]
Hyper-Threading Technology [Enabled]
Quick Power On Self Test [Enabled]
First Boot Device [Hard Disk]
Second Boot Device [CDROM]
Third Boot Device [USB-CDROM]
Boot Other Device [Enabled]
Boot Up NumLock Status [On]
Gate A20 Option [Fast]
Security Option [Setup]
APIC Mode Enabled
MPS Version Control For OS [1.4]
Console Redirection [Enabled]
Baud Rate [9600]
Agent Connect via [NULL]
Agent wait time(min) [1]
Agent after boot [Disabled]
Item Help
Menu Level ▸
Allow the system to skip certain tests while booting. This will decrease the time needed to boot the system
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

NOTE The BIOS default setting of the system is "Previous Setup". It means that if the system is power failure or power loss, the system will come back to previous setup while be re-boot.

If you want to change the BIOS setting, please set up from "Advanced BIOS Features" (Please refer below graphic.)



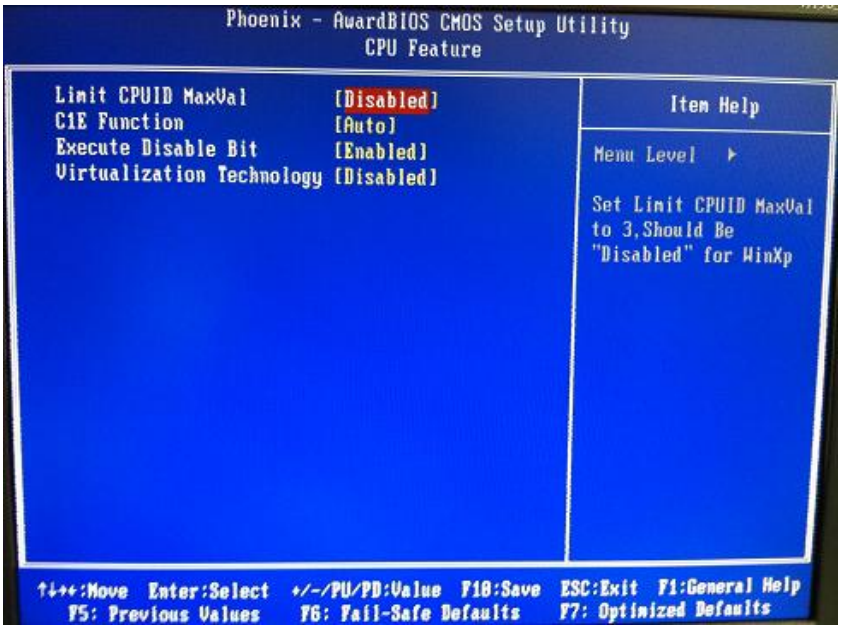
Then, to select "BIOS Optimized" or "Previous Setup" under "Optimized Default Select". (Please refer below graphic.)



Further to save the selection (System will execute about 15 seconds) Finally, please shut down the system, then re-boot it, the system will come back to your changed Optimized Default Select.

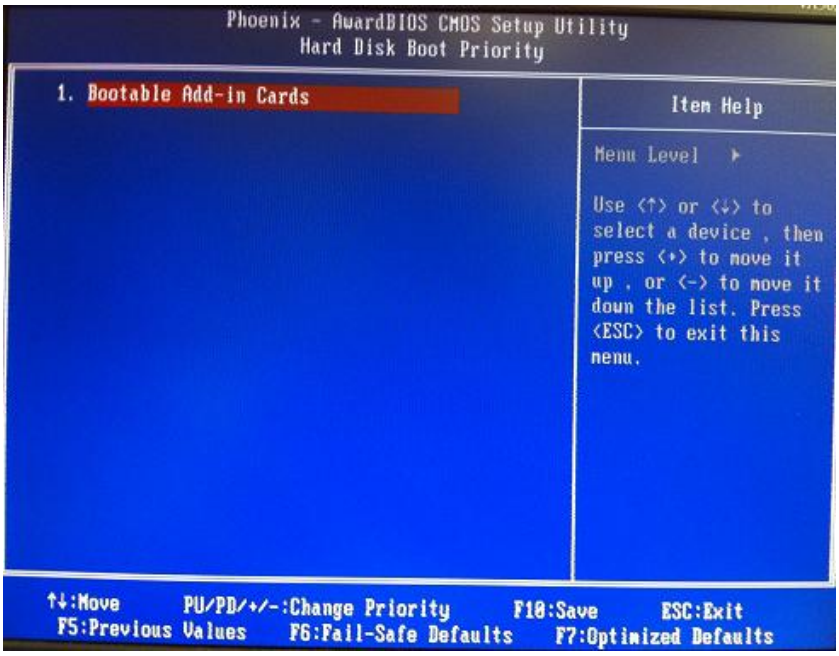
- **CPU Features**

Scroll to this item and press <Enter> to view the CPU Feature sub menu.


Phoenix - AwardBIOS CMOS Setup Utility
CPU Feature
Limit CPUID MaxVal [Disabled]
C1E Function [Auto]
Execute Disable Bit [Enabled]
Virtualization Technology [Disabled]
Item Help
Menu Level ▸
Set Limit CPUID MaxVal to 3,Should Be "Disabled" for WinXp
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

- **Harddisk boot priority**

Scroll to this item and press <Enter> to view the sub menu to decide the disk boot priority


Phoenix - AwardBIOS CMOS Setup Utility
Hard Disk Boot Priority
1. Bootable Add-in Cards
Item Help
Menu Level ▸
Use (↑) or (↓) to select a device , then press (+) to move it up , or (-) to move it down the list. Press (ESC) to exit this menu.
↑↓:Move PU/PD/+/-:Change Priority F10:Save ESC:Exit
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

- **Quick Power On Self Test**
  This option speeds up Power on Self Test (POST) after you turn on the system power. If set as Enabled, BIOS will shorten or skip some check items during POST. The default setting is "Enabled".

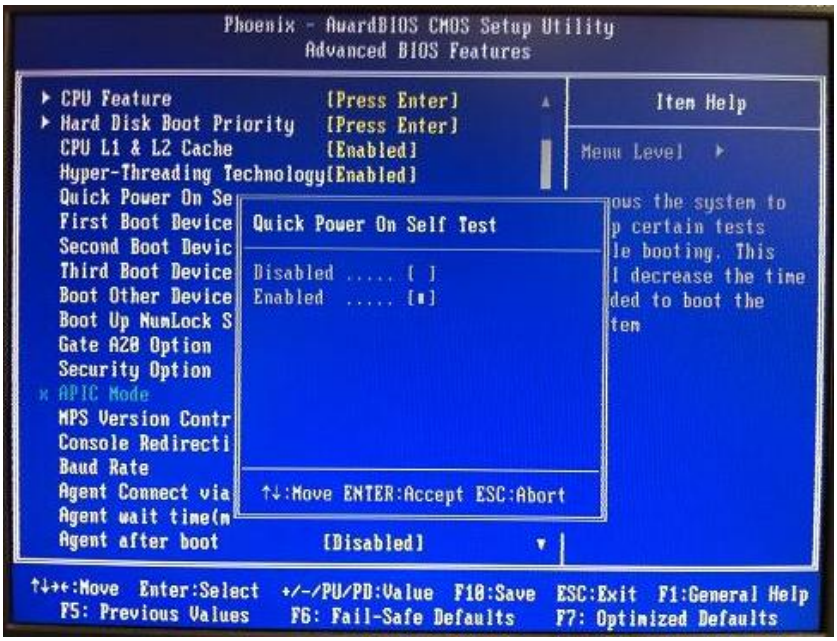
Enabled	Enable Quick POST
Disabled	Normal POST

- **First/Second/Third Boot Device**
  These items let you select the 1st, 2nd, and 3rd devices that the system will search for during its boot-up sequence. There is a wide range of options for your selection.
- **Boot Other Device**
  This item allows the user to enable/disable the boot device not listed on the First/Second/Third boot devices option above. The default setting is "Enabled".
- **Boot Up NumLock Status**
  Set the the Num Lock status when the system is powered on. The default value is "On".
- **Security Option**
  This item allows you to limit access to the system and Setup, or just to Setup. The default value is "Setup".

System
Setup

System System requires correct password before booting, and also before permitting access to the Setup page.

Setup System will boot, but requires correct password before permitting access to Setup. (Default value)



NOTE To disable the security, select PASSWORD SETTING at Main Menu and then you will be asked to enter a password. Do not type anything, just press <Enter> and it will disable the security. Once the security is disabled, the system will boot and you can enter Setup freely.

- **APIC Mode**

APIC (Advanced Programmable Interrupt Controller) mode is *enabled* that provides symmetric multiprocessing (SMP) for systems.

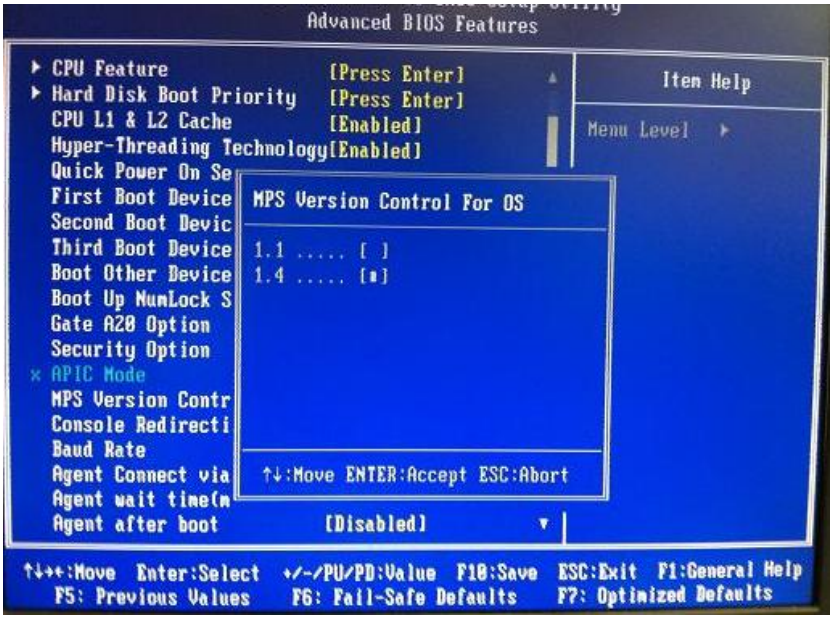
Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features
CPU Feature [Press Enter]
Hard Disk Boot Priority [Press Enter]
CPU L1 & L2 Cache [Enabled]
Hyper-Threading Technology [Enabled]
Quick Power On Self Test [Enabled]
First Boot Device [Hard Disk]
Second Boot Device [CDROM]
Third Boot Device [USB-CDROM]
Boot Other Device [Enabled]
Boot Up NumLock Status [On]
Gate A20 Option [Fast]
Security Option [Setup]
x APIC Mode Enabled
MPS Version Control For OS [1.4]
Console Redirection [Enabled]
Baud Rate [9600]
Agent Connect via [NULL]
Agent wait time(min) [1]
Agent after boot [Disabled]
Item Help
Menu Level ▶
Allows the system to skip certain tests while booting. This will decrease the time needed to boot the system
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

NOTE APIC Mode has been locked and cannot be modified.

- **MPS Version Control For OS**

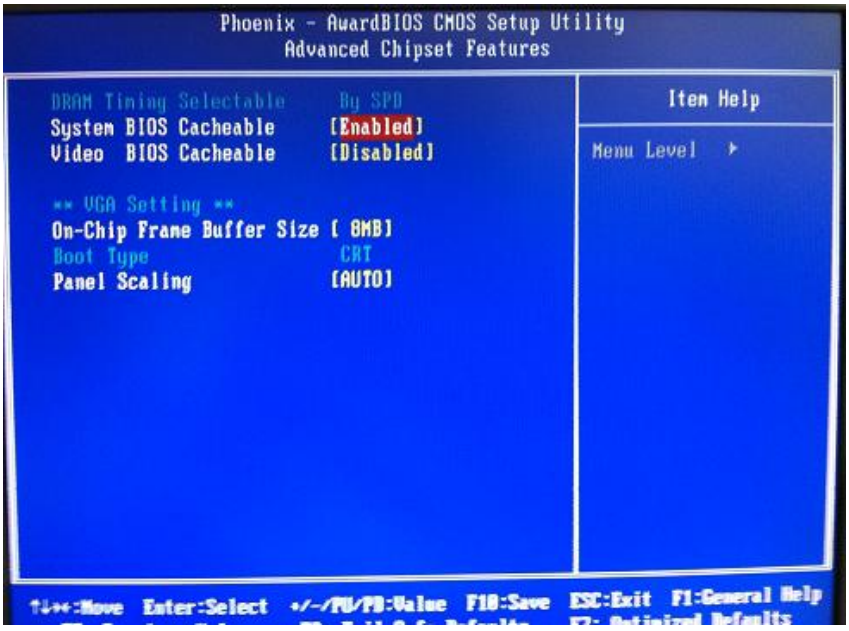
This item specifies the version of the Multiprocessor Specification (MPS). Version 1.4 has extended configuration tables to improve support for multiple PCI bus configurations and provide future expandability.

Press <Esc> to return to the Main Menu page.



3.7 Advanced Chipset Features

This section contains completely optimized chipset's features on the board that you are strongly recommended to leave all items on this page at their default values unless you are very familiar with the technical specifications of your system hardware.


Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features
DRAM Timing Selectable By SPD
System BIOS Cacheable [Enabled]
Video BIOS Cacheable [Disabled]
** VGA Setting **
On-Chip Frame Buffer Size [8MB]
Boot Type CRT
Panel Scaling [AUTO]
Item Help
Menu Level ▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help

- **DRAM Timing Selectable**

Use this item to increase the timing of the memory. This is related to the cooling of memory.

- **System BIOS Cacheable**

Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result. The default value is "Disabled".

- **Video BIOS Cacheable**

This item allows you to change the Video BIOS location from ROM to RAM. Video Shadow will increase the video speed.

***** VGA Setting *****

- **On-Chip Frame Buffer Size**

Use this item to set the VGA frame buffer size.

- **Boot Type** (CRT Only)

This item is to select Display Device that the screen will be shown. But its default is CRT Only and cannot be modified.

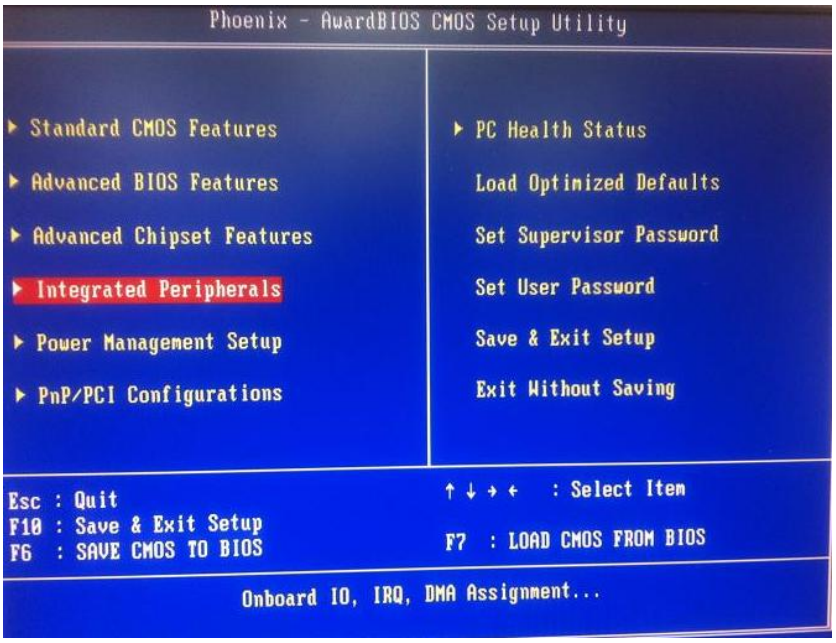
- **Panel Scaling** (AUTO by default)

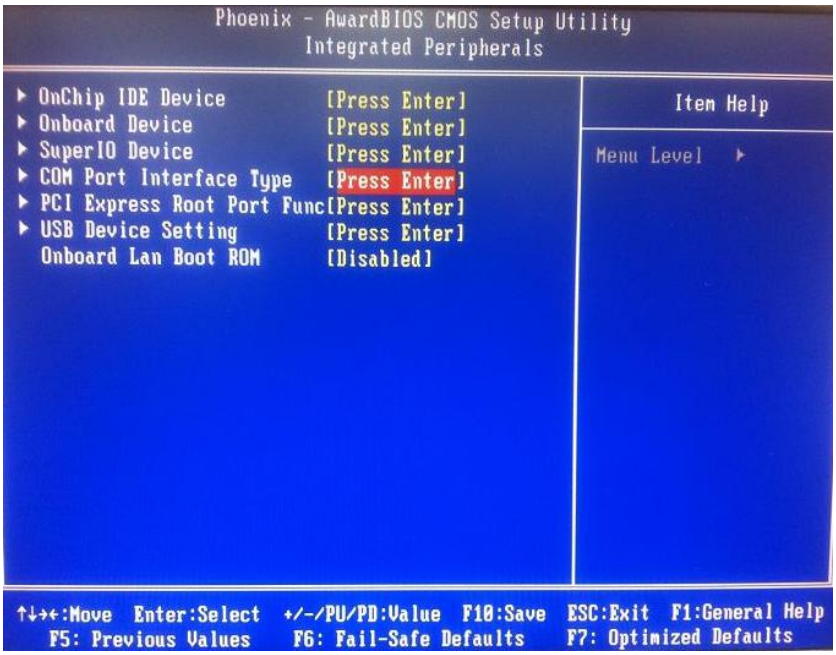
This item shows the setting of panel scaling and operates the scaling function that the panel output can fit the screen resolution connected to the output port. Its default is AUTO and cannot be modified.

Press <Esc> to return to the Main Menu page.

3.8 Integrated Peripherals

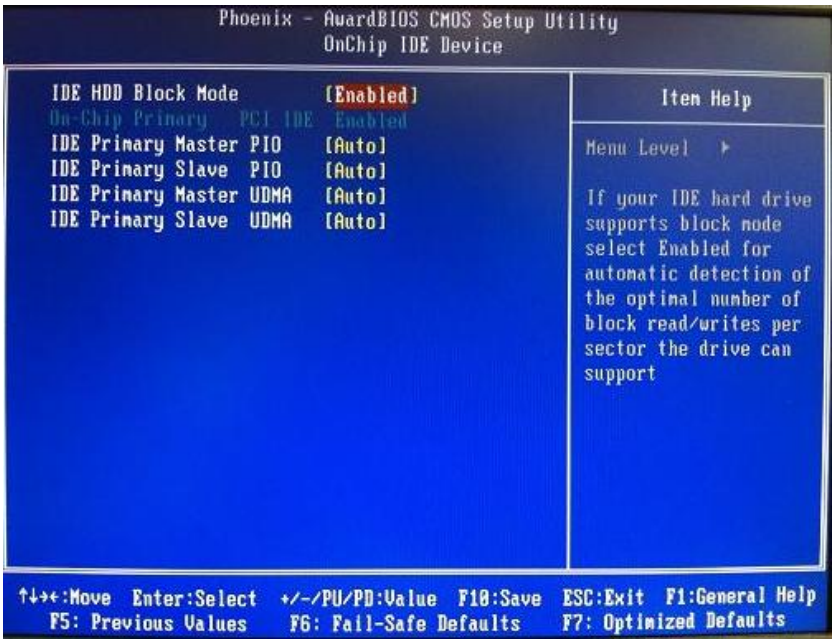
This section allows you to configure your OnChip IDE Device, Onboard Device, COM Ports Interface Type and USB Device Setting…




Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals
OnChip IDE Device [Press Enter]
Onboard Device [Press Enter]
SuperIO Device [Press Enter]
COM Port Interface Type [Press Enter]
PCI Express Root Port Func [Press Enter]
USB Device Setting [Press Enter]
Onboard Lan Boot ROM [Disabled]
Item Help
Menu Level
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

- **OnChip IDE Device**

Scroll to this item and press <Enter> to view the sub menu OnChip IDE Device.


Phoenix - AwardBIOS CMOS Setup Utility
OnChip IDE Device
IDE HDD Block Mode [Enabled]
On-Chip Primary PCI IDE Enabled
IDE Primary Master PIO [Auto]
IDE Primary Slave PIO [Auto]
IDE Primary Master UDMA [Auto]
IDE Primary Slave UDMA [Auto]
Item Help
Menu Level ▸
If your IDE hard drive supports block mode select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

  - **IDE HDD Block Mode**
    Block mode is also called block transfer, multiple commands, and ormultiple sectors read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

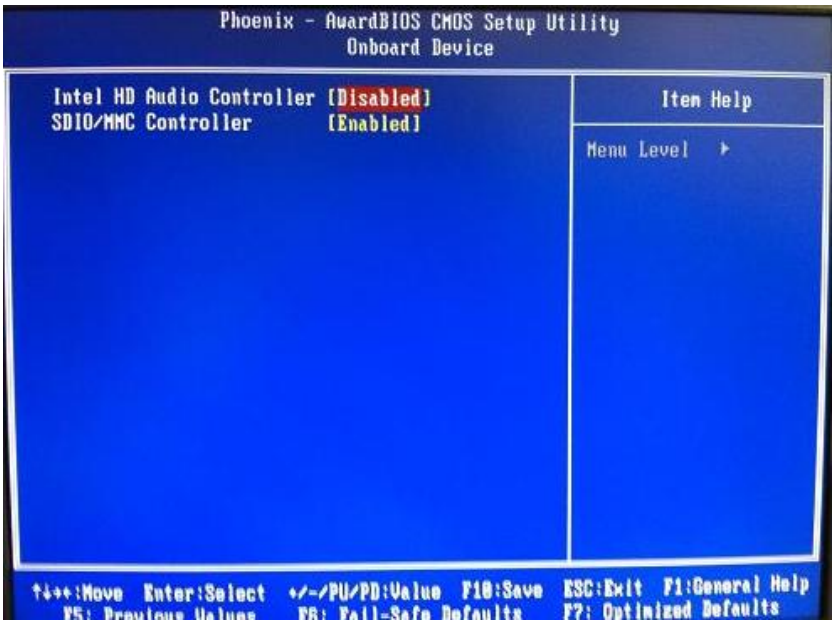
Press <Esc> to return to the Integrated Peripherals page.

Phoenix - AwardBIOS CMOS Setup Utility
OnChip IDE Device
IDE HDD Block Mode [Enabled]
On-Chip Primary PCI IDE Enabled
IDE Primary Master PIO [Auto]
IDE Primary Slave PIO [Auto]
IDE Primary Master UDMA [Auto]
IDE Primary Slave UDMA [Auto]
Iten Help
Menu Level ▸
If your IDE hard drive supports block node select Enabled for automatic detection of the optinal number of block read/writes per sector the drive can support
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

- **Onboard Device**

Scroll to this item and press <Enter> to view the sub menu Onboard Device.

  - **Intel HD Audio Controller**
    Choose Auto to Disabled an Intel HD Audio controller.


Phoenix - AwardBIOS CMOS Setup Utility
Onboard Device
Intel HD Audio Controller [Disabled]
SDIO/MMC Controller [Enabled]
Item Help
Menu Level ▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

- **SDIO/MC Controller (Enabled)**
  Choose *Enabled* on the SDIO/MMC Controller

Phoenix - AwardBIOS CMOS Setup Utility
Onboard Device
Intel HD Audio Controller [Disabled]
SDIO/MMC Controller [Enabled]
Item Help
Menu Level ▸
SDIO/MMC Controller
Enabled ..... [▪]
Disabled ..... [ ]
↑↓:Move ENTER:Accept ESC:Abort
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Press <Esc> to return to the Integrated Peripherals page.

- COM Port Interface Type

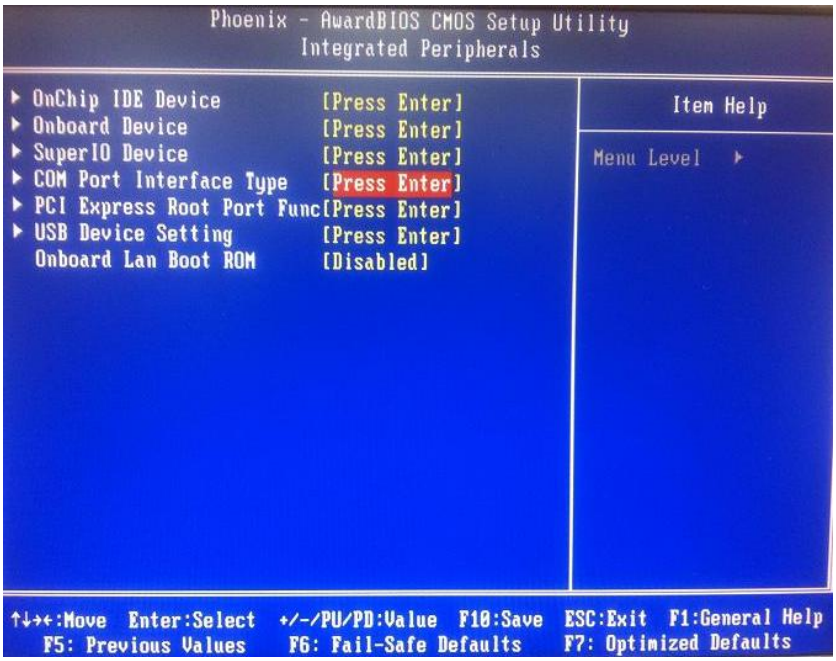
  COM Port 1~2

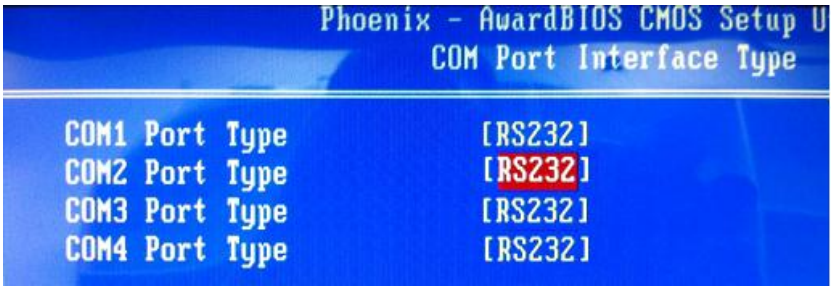
  ➢ The default setting for all COM Ports are RS232, you can change the default setting by selecting the value you want in each COM Port Type.

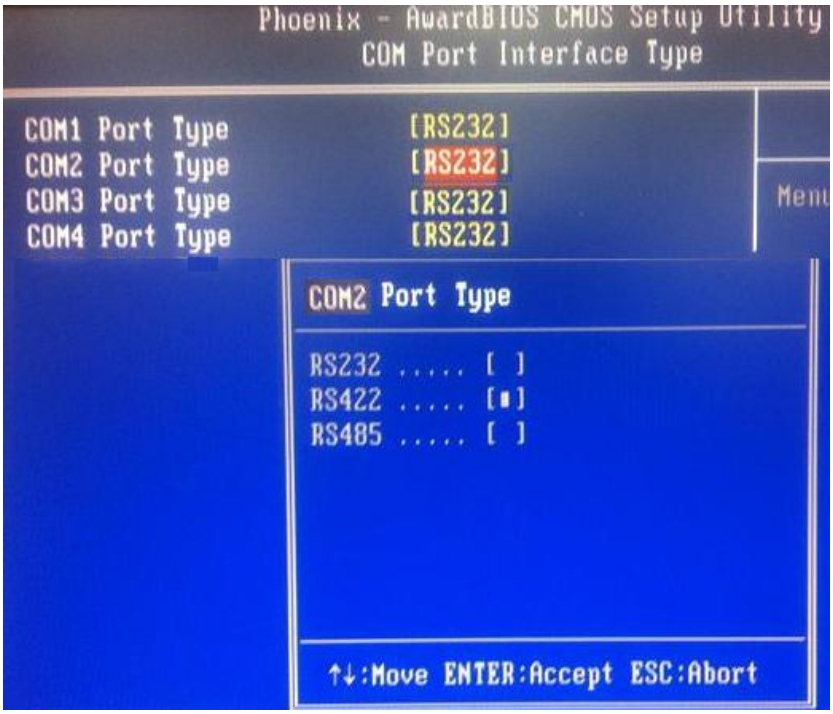
  COM Port 3~4

  ➢ COM3 COM4 had been used for CAN signal, so, only COM1 COM2 can change the setting by selecting the value you want in each COM Port Type.

Press <ESC> to return to the Integrated Peripherals page.


Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals
OnChip IDE Device [Press Enter]
Onboard Device [Press Enter]
SuperIO Device [Press Enter]
COM Port Interface Type [Press Enter]
PCI Express Root Port Func [Press Enter]
USB Device Setting [Press Enter]
Onboard Lan Boot ROM [Disabled]
Item Help
Menu Level
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

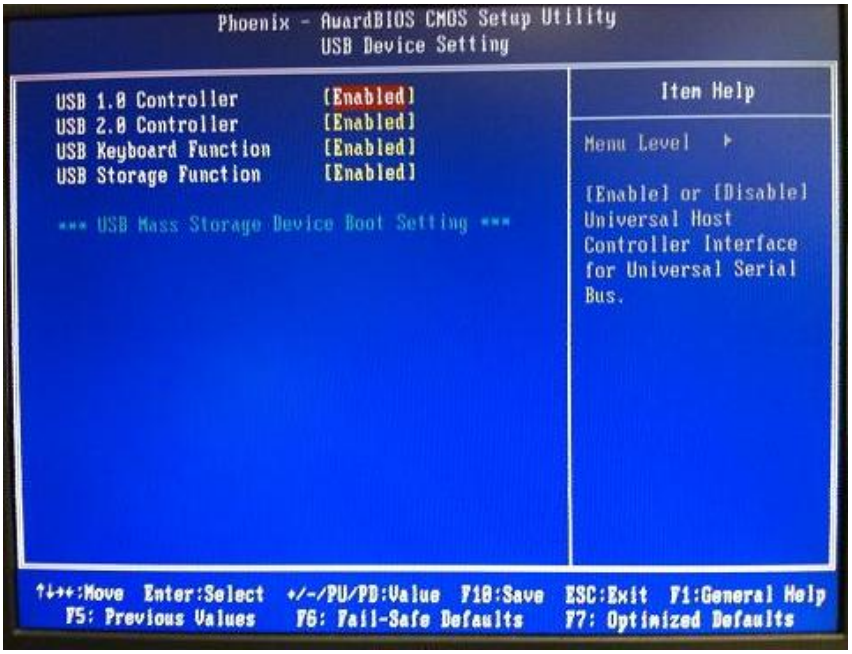

Phoenix - AwardBIOS CMOS Setup U
COM Port Interface Type
COM1 Port Type [RS232]
COM2 Port Type [RS232]
COM3 Port Type [RS232]
COM4 Port Type [RS232]


Phoenix - AwardBIOS CMOS Setup Utility
COM Port Interface Type
COM1 Port Type [RS232]
COM2 Port Type [RS232]
COM3 Port Type [RS232]
COM4 Port Type [RS232]
Menu
COM2 Port Type
RS232 ..... [ ]
RS422 ..... [•]
RS485 ..... [ ]
↑↓:Move ENTER:Accept ESC:Abort

- **USB Device Setting**

Scroll to this item and press <Enter> to view the sub menu USB Device Setting.

Press <Esc> to return to the Integrated Peripherals page.


Phoenix - AwardBIOS CMOS Setup Utility
USB Device Setting
USB 1.0 Controller [Enabled]
USB 2.0 Controller [Enabled]
USB Keyboard Function [Enabled]
USB Storage Function [Enabled]
*** USB Mass Storage Device Boot Setting ***
Item Help
Menu Level ▸
[Enable] or [Disable] Universal Host Controller Interface for Universal Serial Bus.
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

- **Onboard Lan Boot ROM**

Use this item to enable or disable the Boot ROM function of the onboard LAN chip when the system boots up. Its default is *disable*.

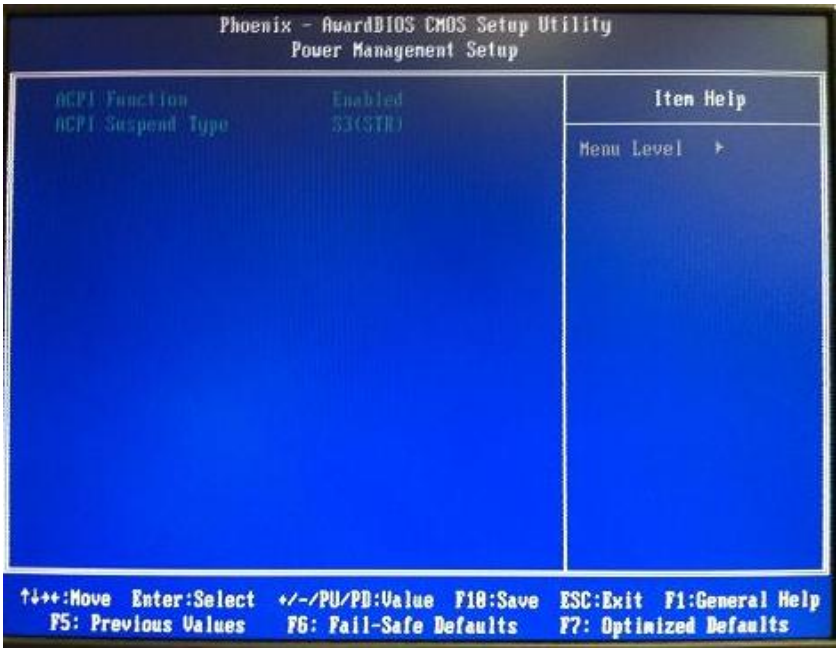
3.9 Power Management Setup

The Power Management Setup allows you to save energy of your system effectively. It will shut down the hard disk and turn OFF video display after a period of inactivity.

- **ACPI Function**

Advanced Configuration and Power Management (ACPI).

The function is always "Enabled".

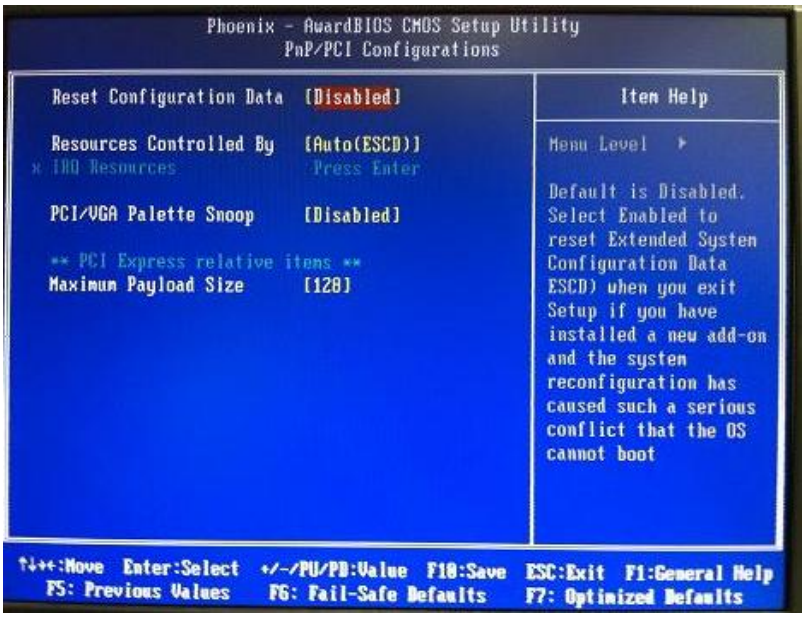

Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup
ACPI Function Enabled
ACPI Suspend Type S3(STR)
Iten Help
Menu Level ▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

3.10 PnP/PCI Configuration Setup

This section describes the configuration of PCI (Personal Computer Interconnect) bus system, which allows I/O devices to operate at speeds close to the CPU speed while communicating with other important components. This section covers very technical items that only experienced users could change default settings.

- **Reset Configuration Data**

Normally, you leave this item Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup or if installing a new add-on cause the system reconfiguration a serious conflict that the operating system can not boot. Options: Enabled, Disabled.


Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations
Reset Configuration Data [Disabled]
Resources Controlled By [Auto(ESCD)]
x IRQ Resources Press Enter
PCI/VGA Palette Snoop [Disabled]
** PCI Express relative items **
Maximum Payload Size [128]
Item Help
Menu Level ▸
Default is Disabled. Select Enabled to reset Extended Systen Configuration Data ESCD) when you exit Setup if you have installed a new add-on and the systen reconfiguration has caused such a serious conflict that the OS cannot boot
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

- **Resources Controlled By**

The Award Plug and Play BIOS can automatically configure all boot and Plug and Play-compatible devices. If you select Auto, all interrupt request (IRQ), DMA assignment and Used DMA fields disappear as the BIOS automatically assign them. The default value is *"Auto"*. The other option is "Manual"

Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations
Reset Configuration Data [Disabled]
Resources Controlled By [Auto(ESCD)]
x IRQ Resources Press Enter
PCI/VGA Palette Snoop [Disabled]
** PCI Express relative items **
Maximum Payload Size [128]
Item Help
Menu Level ▸
BIOS can automatically configure all the boot and Plug and Play compatible devices. If you choose Auto, you cannot select IRQ DMA and memory base address fields, since BIOS automatically assigns them
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

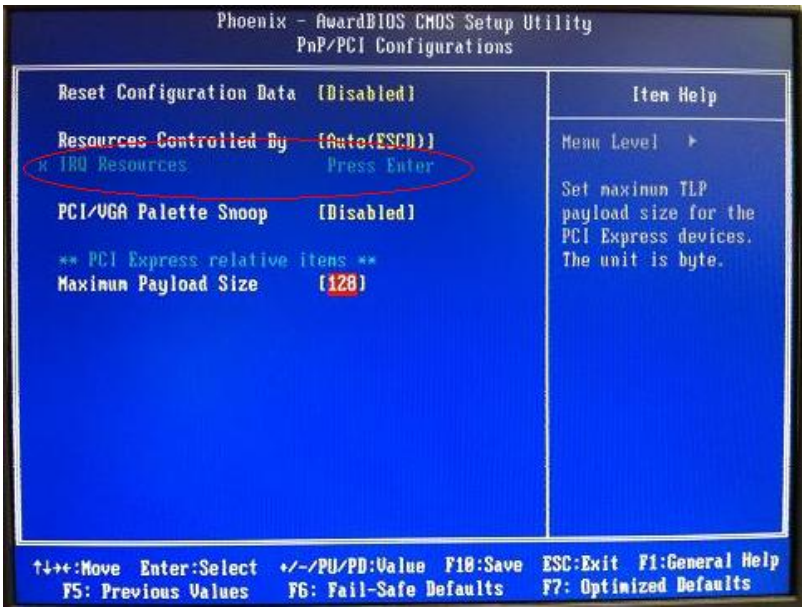
Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations
Reset Configuration Data [Disabled]
Resources Controlled By [Auto(ESCD)]
x IRQ Resources Press Enter
PCI/VGA Palette S
** PCI Express re
Maximun Payload S
Item Help
Menu Level ▸
S can automatically
figure all the
t and Plug and Play
patible devices.
you choose Auto,
cannot select IRQ
and memory base
ress fields, since
S automatically
igns them
Resources Controlled By
Auto(ESCD) ..... [*]
Manual ..... [ ]
↑↓:Move ENTER:Accept ESC:Abort
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

- **IRQ Resources**

When resources are controlled manually, assign each system interrupt to one of the following types in accordance with the type of devices using the interrupt:

1. Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1).
2 . PCI/ISA PnP Devices compliant with the Plug and Play standard,

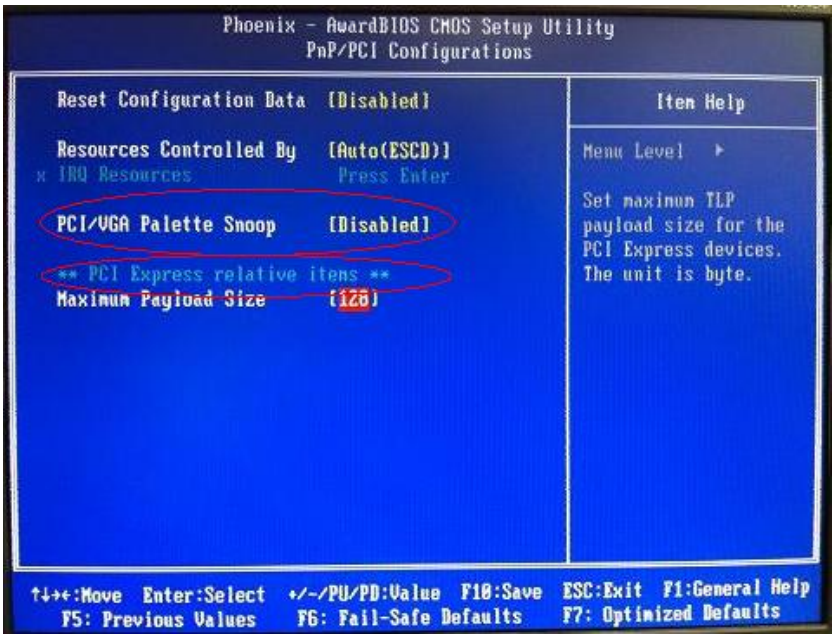
whether designed for PCI or ISA bus architecture.The default value is "PCI/ISA PnP".


Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations
Reset Configuration Data [Disabled]
Resources Controlled By [Auto(ESCD)]
x IRQ Resources Press Enter
PCI/VGA Palette Snoop [Disabled]
** PCI Express relative items **
Maximum Payload Size [128]
Item Help
Menu Level ▸
Set maximun TLP payload size for the PCI Express devices. The unit is byte.
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

- **PCI/VGA Palette Snoop**

Some non-standard VGA display cards may not show colors properly. This item allows you to set whether MPEG ISA/VESA VGA Cards can work with PCI/VGA or not. When enabled, a PCI/VGA can work with a MPEG ISA/VESA VGA card; when disabled, a PCI/VGA cannot work with a MPEG ISA/VESA Card.

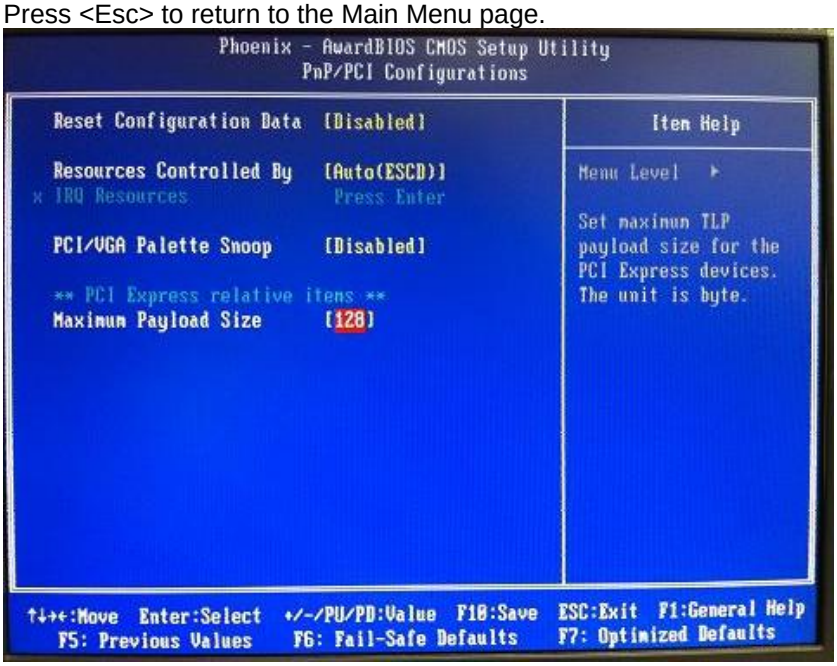
**** PCI Express relative items ****


Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations
Reset Configuration Data [Disabled]
Resources Controlled By [Auto(ESCD)]
x IRQ Resources Press Enter
PCI/VGA Palette Snoop [Disabled]
** PCI Express relative items **
Maximum Payload Size [128]
Item Help
Menu Level ▸
Set maximun TLP payload size for the PCI Express devices. The unit is byte.
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

- **Maximum Payload Size**

When using DDR SDRAM and Buffer size selection, another consideration in designing a payload memory is the size of the buffer for data storage. Maximum Payload Size defines the maximum TLP (Transaction Layer Packet) data payload size for the device.

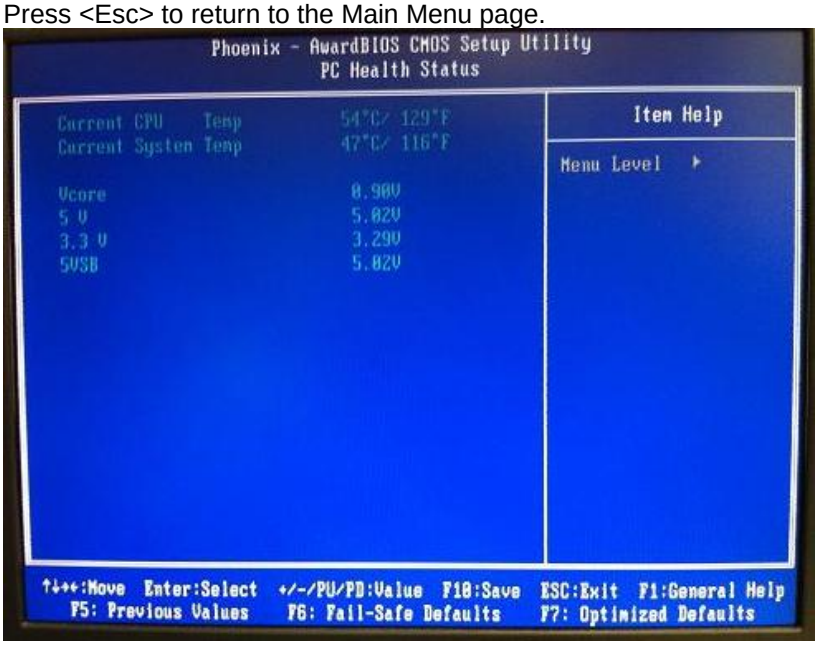
Press <Esc> to return to the Main Menu page.


Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations
Reset Configuration Data [Disabled]
Resources Controlled By [Auto(ESCD)]
x IRQ Resources Press Enter
PCI/VGA Palette Snoop [Disabled]
** PCI Express relative items **
Maximum Payload Size [128]
Item Help
Menu Level ▸
Set maximun TLP payload size for the PCI Express devices. The unit is byte.
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

3.11 PC Health Status

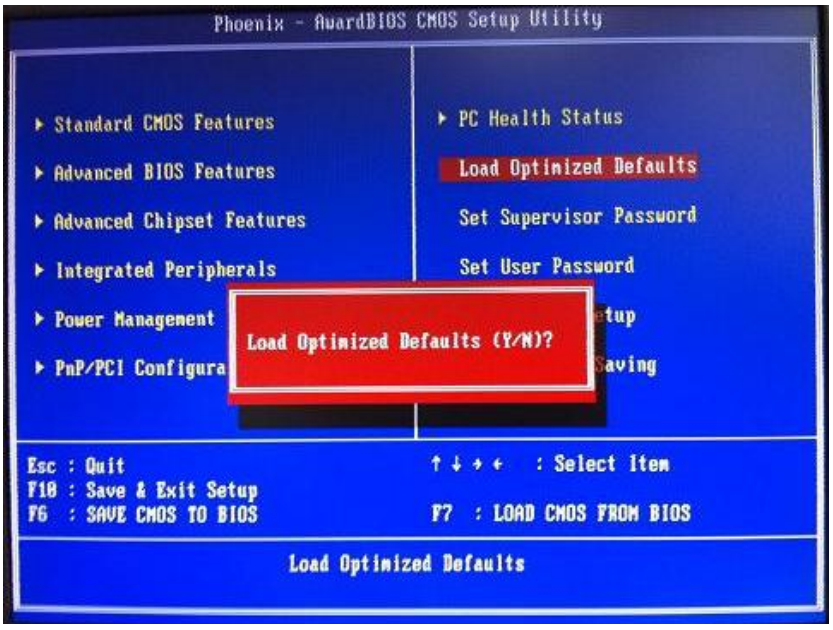
This section supports hardware monitoring that lets you monitor those parameters for critical voltages, temperatures and fan speed of the board.

Press <Esc> to return to the Main Menu page.


Phoenix - AwardBIOS CMOS Setup Utility
PC Health Status
Current CPU Temp 54°C/ 129°F
Current System Temp 47°C/ 116°F
Vcore 0.90V
5 V 5.02V
3.3 V 3.29V
5VSB 5.02V
Item Help
Menu Level ▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

3.12 Load Optimized Defaults

This option allows you to load your system configuration with default values. These default settings are optimized to enable high performance features.



To load CMOS SRAM with SETUP default values, please enter "Y". If not, please enter "N".

3.13 Set Supervisor/User Password

You can set a supervisor or user password, or both of them. The differences between them are:

1 **Supervisor password:** You can enter and change the options on the setup menu.
2 **User password:** You can just enter, but have no right to change the options on the setup menu.

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD

Type a maximum eight-character password, and press <Enter>. This typed password will clear previously entered password from the CMOS memory. You will be asked to confirm this password. Type this password again and press <Enter>. You may also press <Esc> to abort this selection and not enter a password.

To disable the password, just press <Enter> when you are prompted to enter a password. A message will confirm the password is getting disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

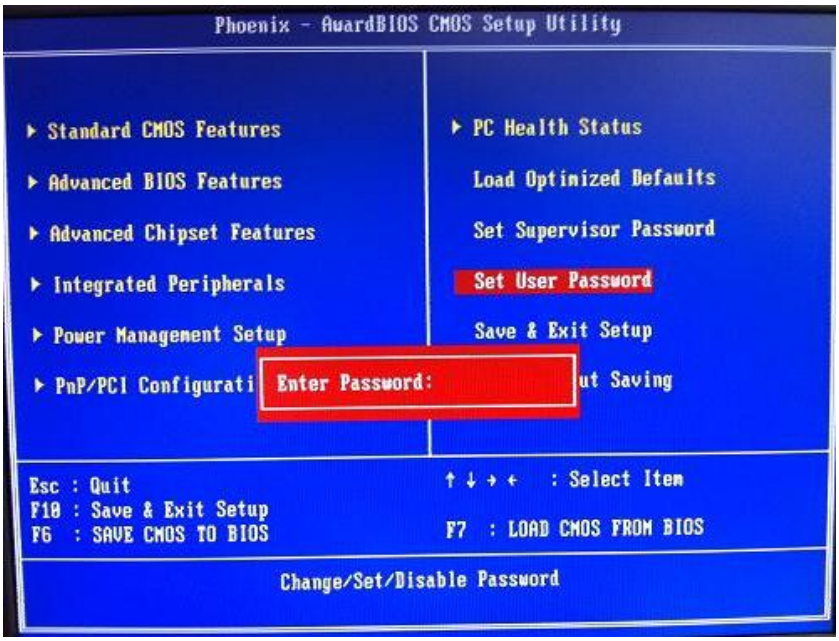
PASSWORD DISABLED

When a password is enabled, you have to type it every time you enter the Setup. It prevents any unauthorized persons from changing your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time the system reboots. This would prevent unauthorized use of your computer.

You decide when the password is required for the BIOS Features Setup Menu and its Security option. If the Security option is set to "System", the password is required during booting up and entry into the Setup; if it is set as "Setup", a prompt will only appear before entering the Setup.

Standard CMOS Features
Advanced BIOS Features
Advanced Chipset Features
Integrated Peripherals
Power Management Setup
PnP/PCI Configurati
PC Health Status
Load Optimized Defaults
Set Supervisor Password
Set User Password
Save & Exit Setup
Enter Password:
ut Saving
Esc : Quit
F10 : Save & Exit Setup
F6 : SAVE CMOS TO BIOS
↑ ↓ → ← : Select Item
F7 : LOAD CMOS FROM BIOS
Change/Set/Disable Password

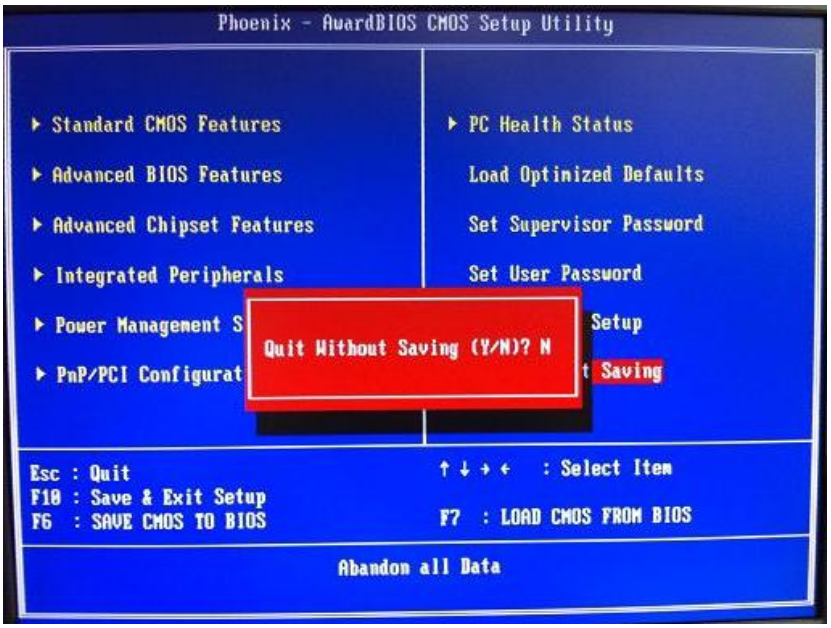

Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features
Advanced BIOS Features
Advanced Chipset Features
Integrated Peripherals
Power Management Setup
PnP/PCI Configurati
PC Health Status
Load Optimized Defaults
Set Supervisor Password
Set User Password
Save & Exit Setup
Enter Password:
ut Saving
Esc : Quit
F10 : Save & Exit Setup
F6 : SAVE CMOS TO BIOS
↑ ↓ → ← : Select Item
F7 : LOAD CMOS FROM BIOS
Change/Set/Disable Password

3.14 Save & Exit Setup

This section allows you to determine whether or not to accept your modifications. Type "Y" to quit the setup utility and save all changes into the CMOS memory. Type "N" to bring you back to the Previous Setup utility.

3.15 Exit Without Saving

Select this option to exit the Setup utility without saving changes you have made in this session. Type "Y", and it will quit the Setup utility without saving your modifications and come back to Previous Setup utility. Type "N" to return to the Setup utility.



CHAPTER 4
INSTALLATION OF DRIVERS

4.1 Installation Of LAN Driver Update

- My Computer→ Press the right key of Mouse →Properties→Hardware→Device Manager→Network adapters→Update Driver (Refer below Picture-1)

(Picture-1)

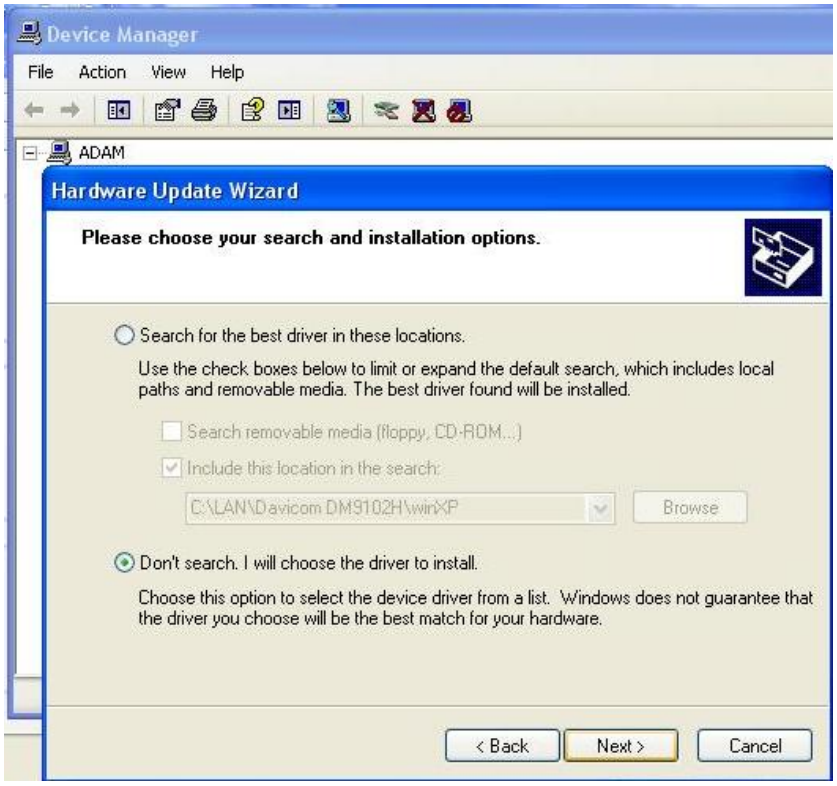
- nstall from a list or specific location →Include this location in the search (Pls refer below Picture-2)

(Picture-2)

Device Manager
File Action View Help
ADAM
Hardware Update Wizard
Welcome to the Hardware Update Wizard
This wizard helps you install software for:
DAVICOM 9102/A PCI Fast Ethernet Adapter
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

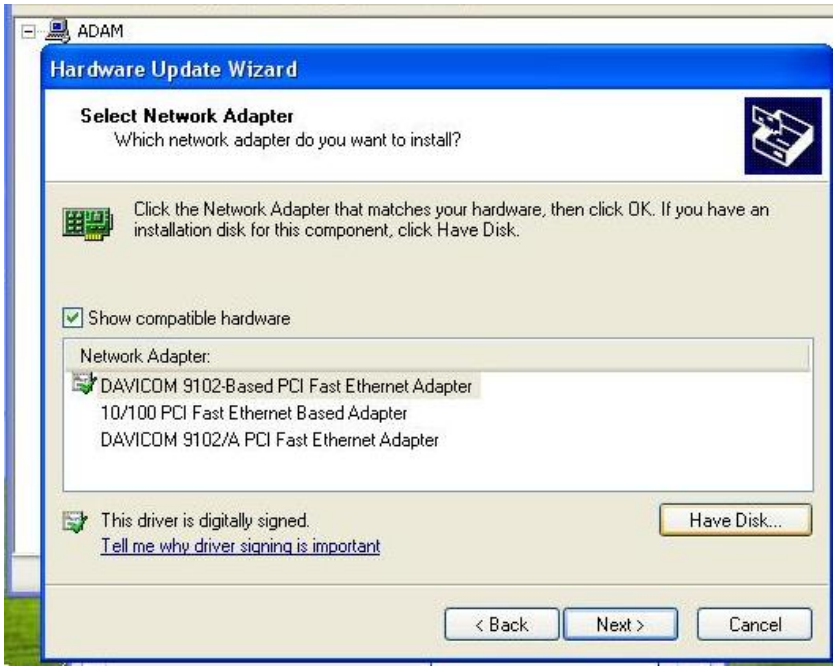
- Don't search I will choose the driver to install →"Next" (Pls refer below Picture-3)

(Picture-3)


Device Manager
File Action View Help
ADAM
Hardware Update Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
C:\LAN\Davicom DM9102H\winXP
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

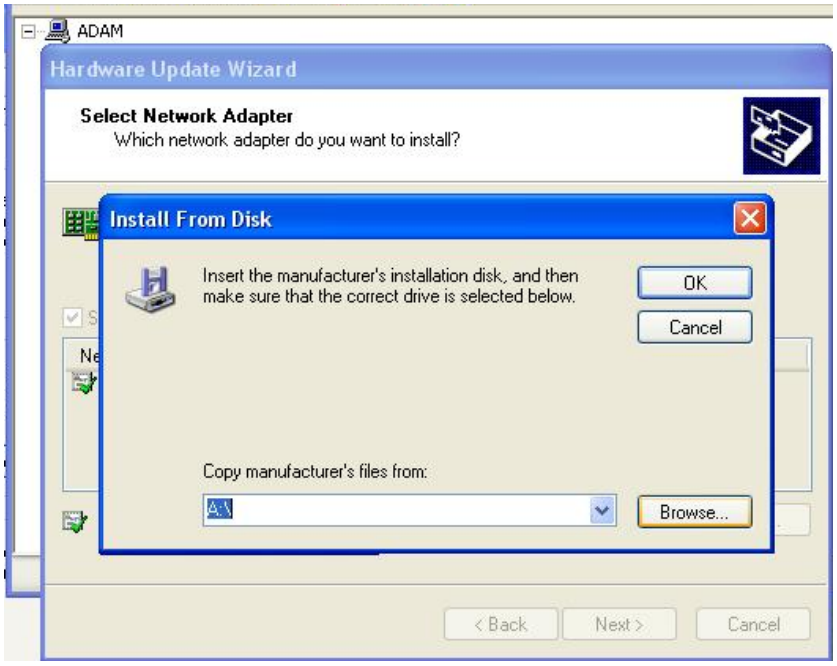
- Select "Have Disk.." (Pls refer below Picture-4)

(Picture-4)


ADAM
Hardware Update Wizard
Select Network Adapter
Which network adapter do you want to install?
Click the Network Adapter that matches your hardware, then click OK. If you have an installation disk for this component, click Have Disk.
Show compatible hardware
Network Adapter:
DAVICOM 9102-Based PCI Fast Ethernet Adapter
10/100 PCI Fast Ethernet Based Adapter
DAVICOM 9102/A PCI Fast Ethernet Adapter
This driver is digitally signed.
Tell me why driver signing is important
Have Disk...
< Back
Next >
Cancel

- Select "Browse.." (Pls refer below Picture-5)

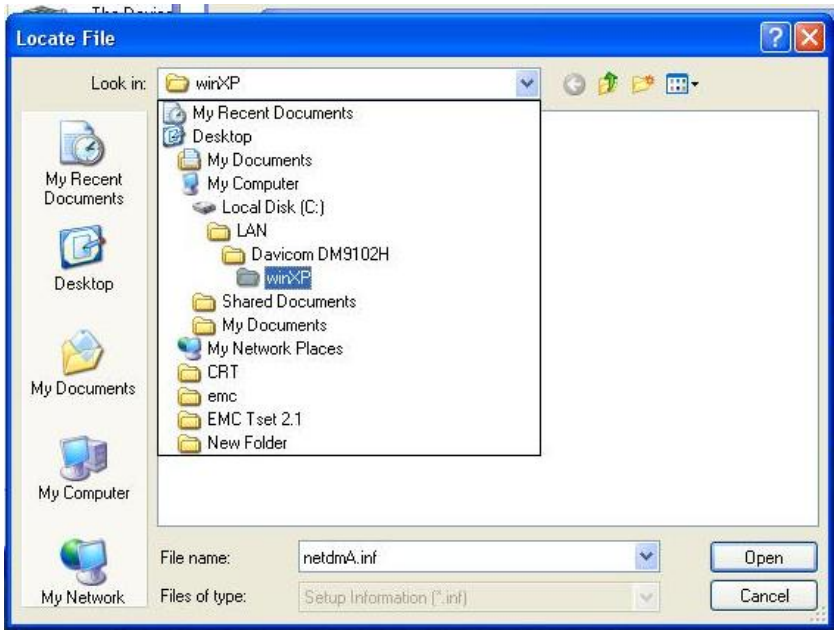
(Picture-5)



- Choose the file location loop on CD file as follow

E:\Drivers\LAN\Davicom DM9102H\winXP\netdmA (Pls refer below Picture-6)

(Picture-6)



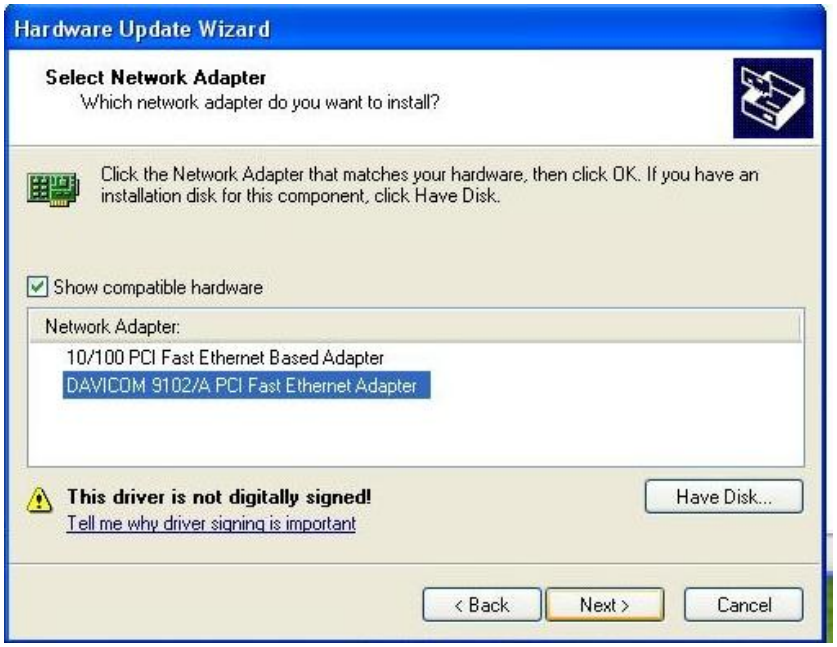
- Select "OK" (Pls refer below Picture-7)

(Picture-7)

Hardware Update Wizard
Select Network Adapter
Which network adapter do you want to install?
Install From Disk
Insert the manufacturer's installation disk, and then make sure that the correct drive is selected below.
OK
Cancel
Copy manufacturer's files from:
C:\LAN\Davicom DM9102H\winXP
Browse...

- Choose DAVICOM 9102/A PCI Fast Ethernet Adapter →"Next" (Pls refer below Picture-8)

(Picture-8)


Hardware Update Wizard
Select Network Adapter
Which network adapter do you want to install?
Click the Network Adapter that matches your hardware, then click OK. If you have an installation disk for this component, click Have Disk.
Show compatible hardware
Network Adapter:
10/100 PCI Fast Ethernet Based Adapter
DAVICOM 9102/A PCI Fast Ethernet Adapter
This driver is not digitally signed!
Tell me why driver signing is important
Have Disk...
< Back
Next >
Cancel

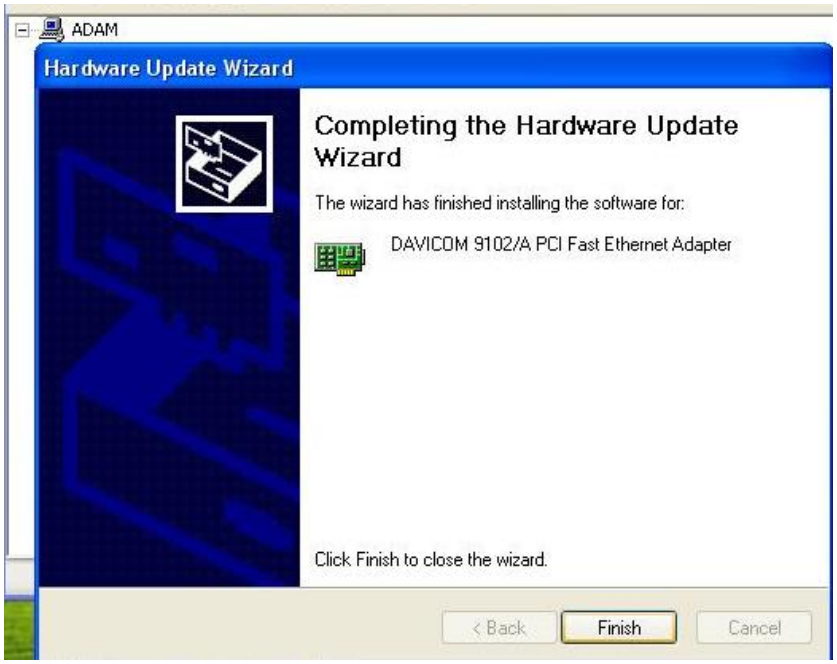
- Select "Continue Anyway" (Pls refer below Picture-9)

(Picture-9)

Hardware Installation
The software you are installing for this hardware:
DAVICOM 9102/A PCI Fast Ethernet Adapter
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

- Select "Finish" (Pls refer below Picture-10)

(Picture-10)

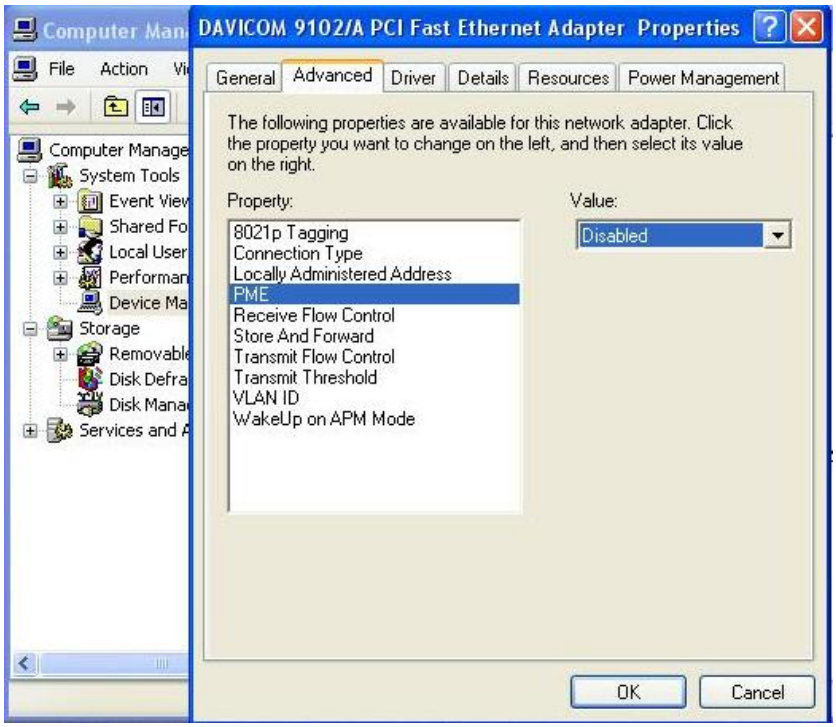


- Select "Properties" (Pls refer below Picture-11)

(Picture-11)

- Check the Advance WakeUp on PME Mode Value is Disable (Pls refer below Picture-12)

(Picture-12)



4.2 Notice For Installation Of Driver

**** NOTICE ****

Two graphics drivers, but only one can be installed in the system.

- **Windows XP GMA 500 driver**

The default setting of display output under Windows XP GMA 500 driver is LVDS port.

If you only connect VGA port to install driver, please press **"Ctrl+Alt+F1"** to switch the display output to VGA port.

- **Windows XP IEGD driver**

The default setting of display output is VGA port.

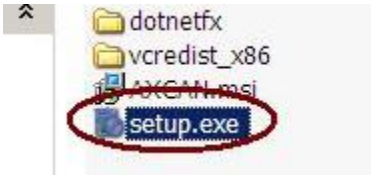
MEMO:

CHAPTER 5
Using AXCAN Software Utility

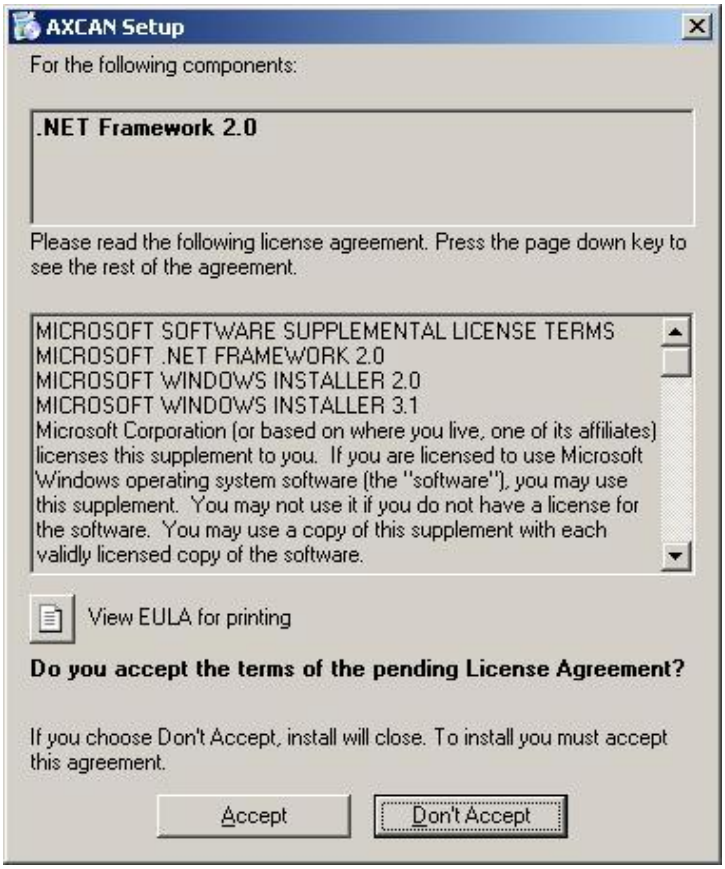
5.1 Installation Of CAN Utility

This section describes how to install AXCAN software utility. Please follow the step by step instructions given below.

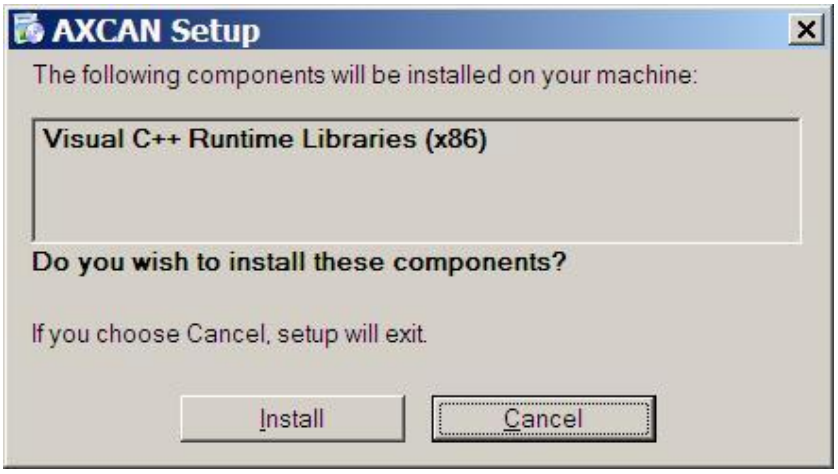
1. Double click the setup icon to run setup.exe program and begin installation.



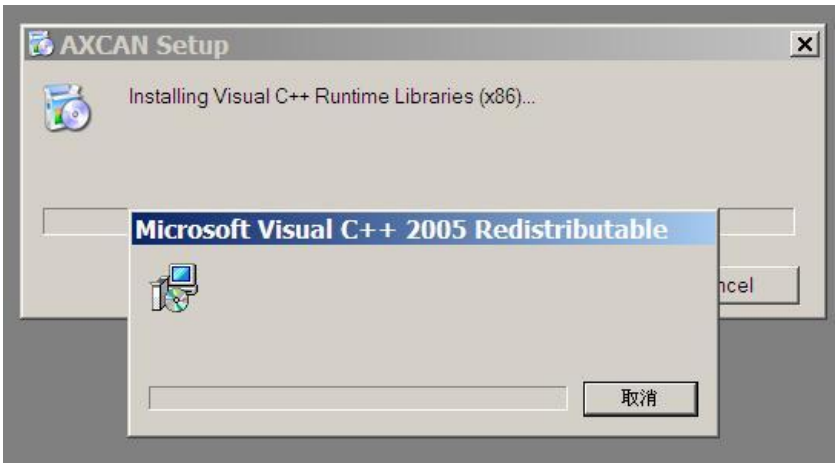
2. The setup program automatically detect whether .NET Framework 2.0 exists in your computer. Read the license agreement and make your choice.


AXCAN Setup
For the following components:
.NET Framework 2.0
Please read the following license agreement. Press the page down key to see the rest of the agreement.
MICROSOFT SOFTWARE SUPPLEMENTAL LICENSE TERMS
MICROSOFT .NET FRAMEWORK 2.0
MICROSOFT WINDOWS INSTALLER 2.0
MICROSOFT WINDOWS INSTALLER 3.1
Microsoft Corporation (or based on where you live, one of its affiliates) licenses this supplement to you. If you are licensed to use Microsoft Windows operating system software (the "software"), you may use this supplement. You may not use it if you do not have a license for the software. You may use a copy of this supplement with each validly licensed copy of the software.
View EULA for printing
Do you accept the terms of the pending License Agreement?
If you choose Don't Accept, install will close. To install you must accept this agreement.
Accept
Don't Accept

3. Click Install button to install Visual C++ Runtime Libraries (x86).


AXCAN Setup
The following components will be installed on your machine:
Visual C++ Runtime Libraries (x86)
Do you wish to install these components?
If you choose Cancel, setup will exit.
Install
Cancel

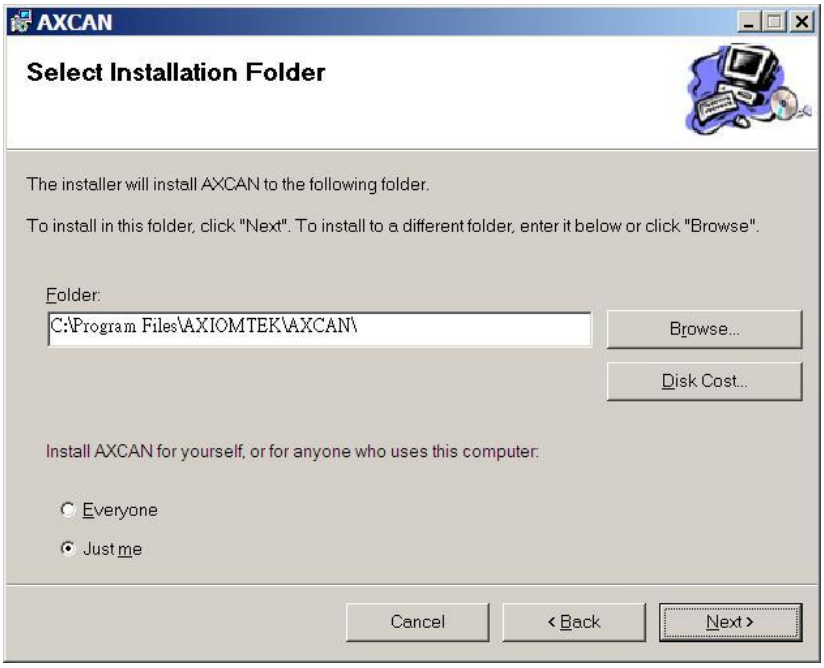
4. The setup program is installing files of Visual C++ Runtime Libraries (x86) into your computer.



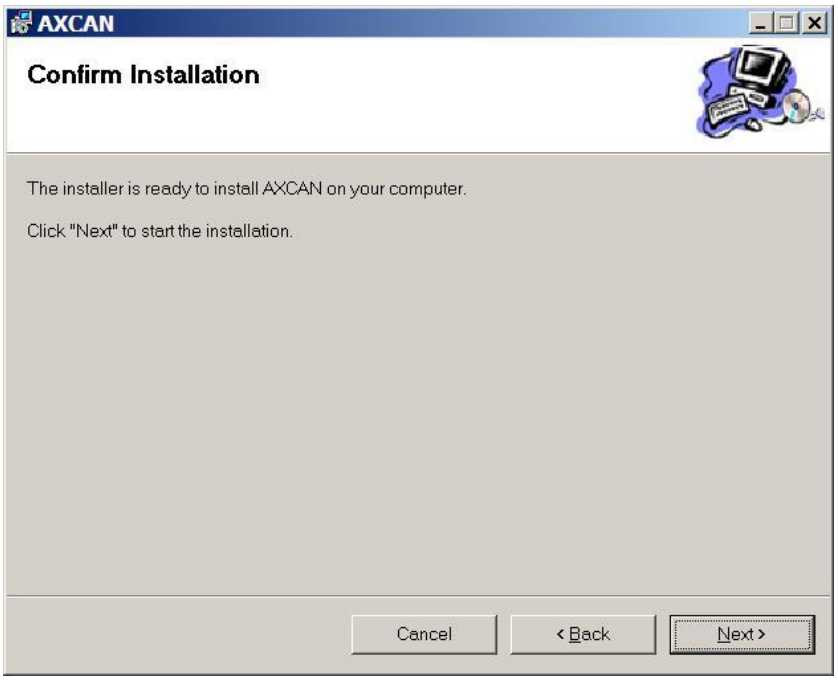
5. After all of the necessary components are installed, let's continue with AXCAN utility setup wizard.

AXCAN
Welcome to the AXCAN Setup Wizard
The installer will guide you through the steps required to install AXCAN on your computer.
WARNING: This computer program is protected by copyright law and international treaties. Unauthorized duplication or distribution of this program, or any portion of it, may result in severe civil or criminal penalties, and will be prosecuted to the maximum extent possible under the law.
Cancel
< Back
Next >

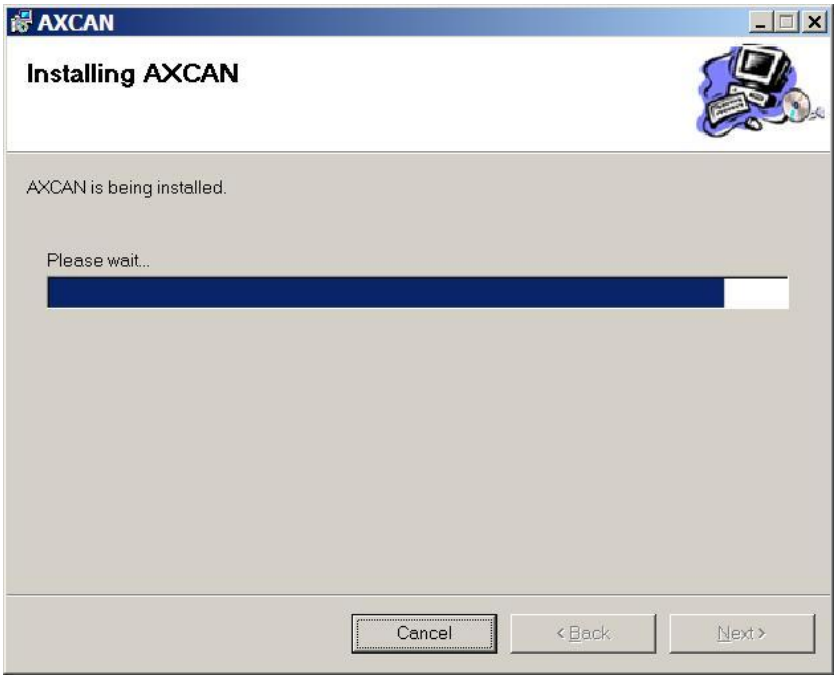
6. By default, the utility is installed to C:\Program Files\AXIOMTEK\AXCAN. Change the location if needed. Select the permission to install AXCAN for yourself or for anyone who uses this computer. Click Next to continue


AXCAN
Select Installation Folder
The installer will install AXCAN to the following folder.
To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse".
Folder:
C:\Program Files\AXIOMTEK\AXCAN\
Browse...
Disk Cost...
Install AXCAN for yourself, or for anyone who uses this computer:
Everyone
Just me
Cancel
< Back
Next >

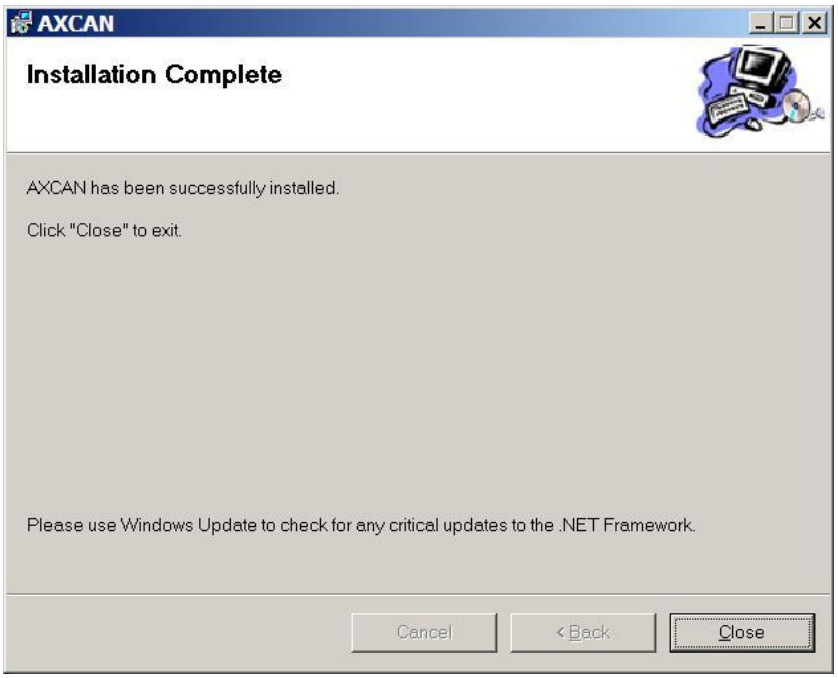
7. Now the setup program is ready to install AXCAN software utility. Click Next to continue.


AXCAN
Confirm Installation
The installer is ready to install AXCAN on your computer.
Click "Next" to start the installation.
Cancel
< Back
Next >

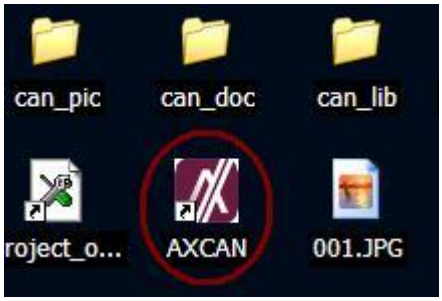
8. The setup program is installing AXCAN software utility. Wait until the installation is complete before progressing to the next step.



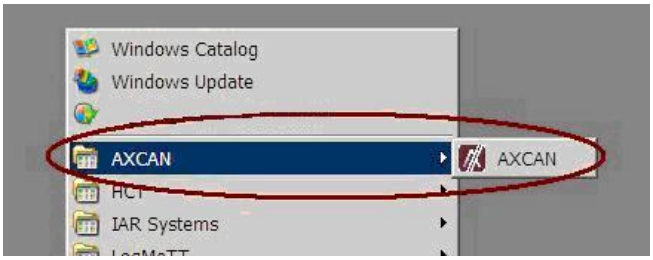
9. The AXCAN software utility has been successfully installed. Click Close to exit.



10. After installation, a shortcut icon is automatically created on your desktop.



11. The setup program also creates program menu shortcut of AXCAN.

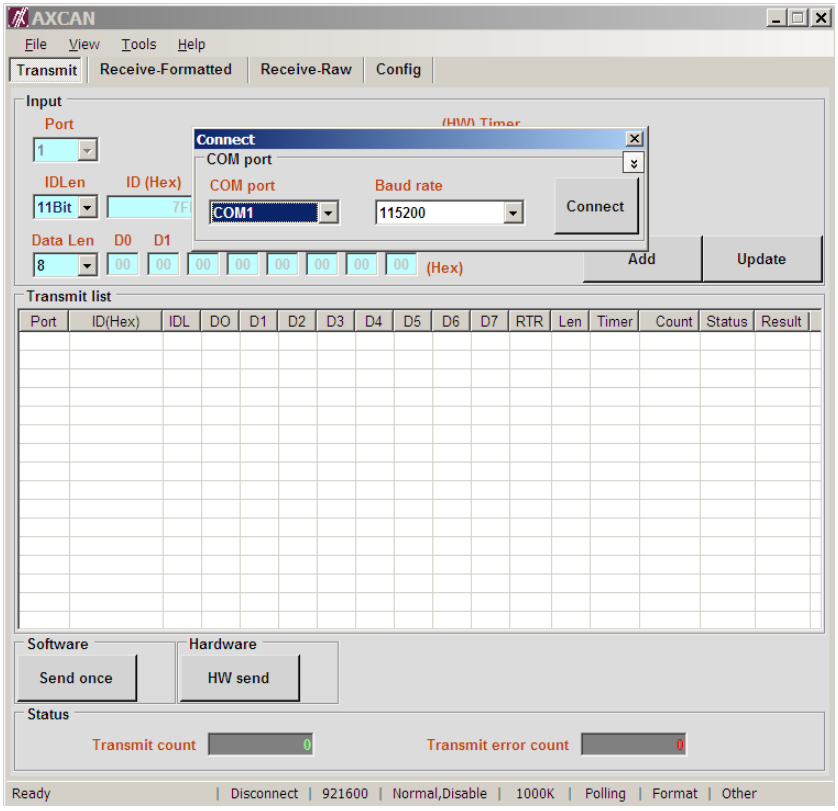


5.2 Overview

Before you start using AXCAN software utility, please check the hardware connection:

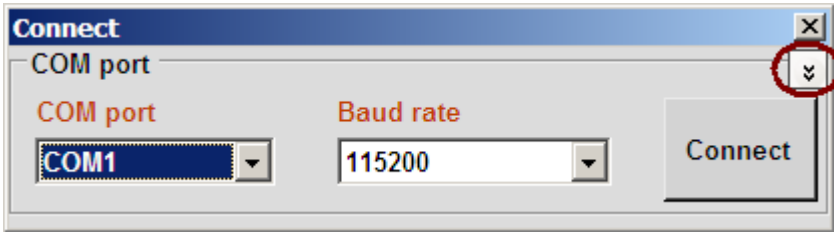
- Firmly connect the rBOX103-FL's CAN interface connector to CAN devices.

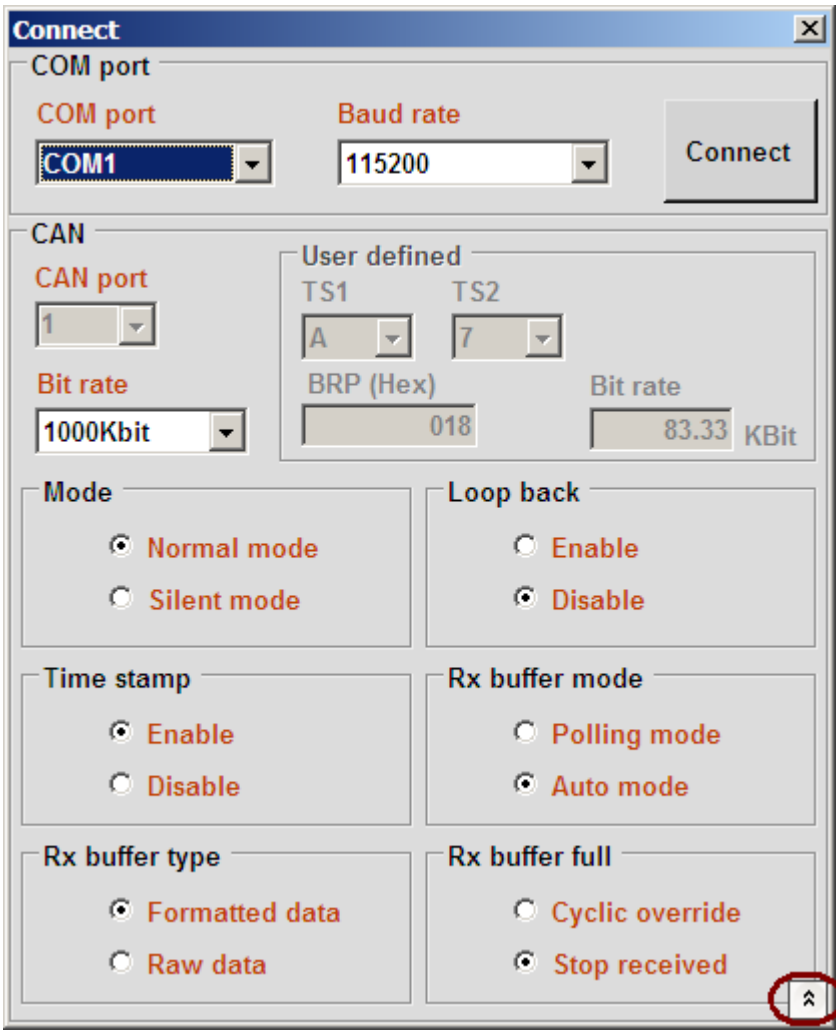
Using this utility to configure CAN communication parameters. It is also used to transmit or receive CAN messages for simple function testing. Open utility program by clicking AXCAN.exe.



5.3 Connect Setting Window

Find the double arrows to the bottom button on Connect Setting window. Click this button to open more detailed hidden settings window. To close, click on the double arrows to the top button. Use the parameters on this window for connection settings.





Enter connection parameters properly, see below information, then click the Connect button. The software automatically saves all settings when the CAN connection is established successfully.

COM ports communicate with CAN controller.

To use this item to select COM port no. which is an interface on COM3 or COM4 of rBOX103.

Baud rate

Select COM port baud rate.

CAN port

To select CAN port no. which is an interface between device and device.

Bit rate

To select CAN communication bit rate. Bit rate is the number of data bits transmitted per second in CAN communication channel.

User-defined : TS1, TS2, BRP

User can define bit rate based on this parameters. Bit rate = (36M / ((TS1+TS2+1) * BRP)).

CAN Mode

Normal mode is for CAN normal operation. In silent mode, the device is set as receive-only.

Loop back

Enable/disable loopback. If loopback is enabled, the device is set as transmit-only. It receives only messages routed internally from TX to RX.

Time stamp

Enable/disable timestamp. Time stamp is the time at which message is received by PC (per bit rate).

Rx buffer mode

Polling mode	Device sends message back upon PC request.
Auto mode	Device sends messages back to PC automatically. In auto mode, you cannot transmit data.

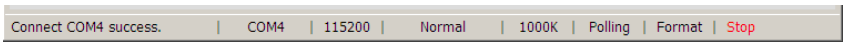
Rx buffer type

Formatted Data	Device sends back formatted data.
Raw Data	Device sends back raw data.

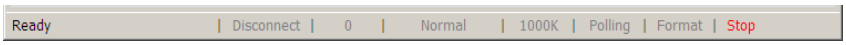
Rx buffer full

Cyclic override	Overwrite old data when device buffer is full.
Stop received	Stop receiving data when device buffer is full.

The status bar shows "Connect COMx success" message, when success connection is established. You can also see the connection parameters on the status bar.

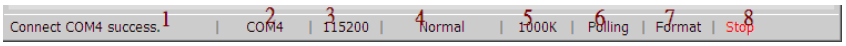


If connection attempt failed, the status bar shows "Disconnect" message. And at the same time, the connection parameters show up in gray.



Status Bar Information

The status bar displays at the bottom of Connect Setting window. It provides feedback of current settings and status information.

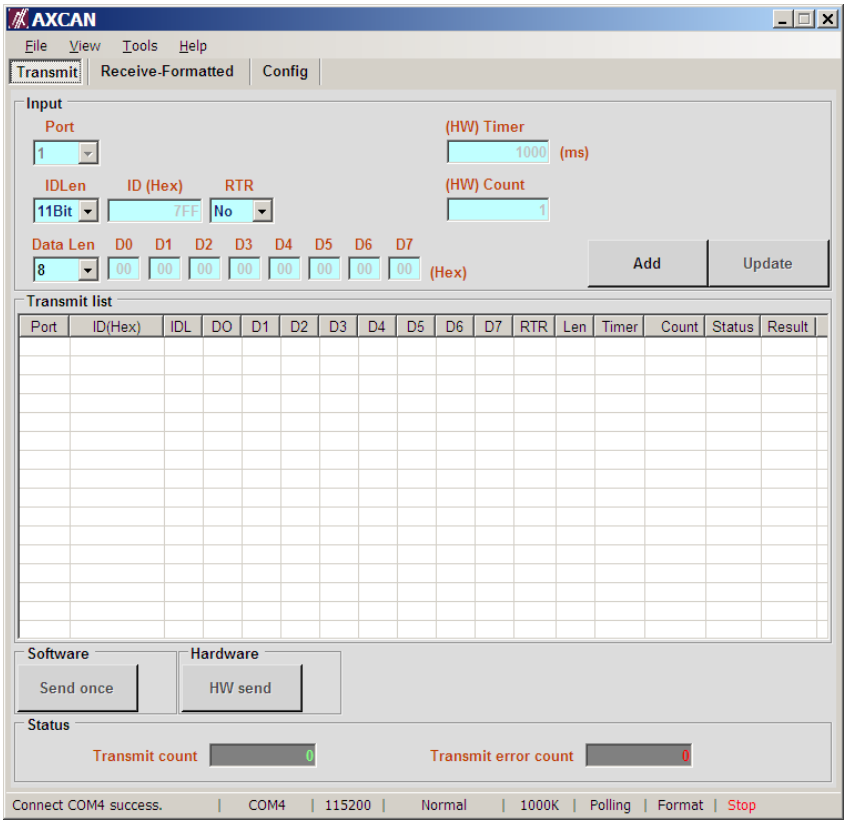


1. Connection messages.
2. COM port no. or Disconnect message.
3. COM port baud rate.
4. CAN operation mode.
5. CAN communication bit rate.
6. Rx buffer mode.
7. Rx buffer type.
8. Other status information; Stop, Polling, Looping or Testing.

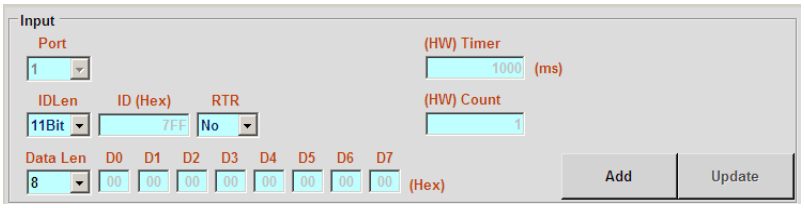
5.4 Transmit Setting Window

After success connection is established, the Transmit Setting page appears immediately. If Rx buffer is set to auto mode or Rx buffer type is set to raw data, this page will not appear. It consists of 4 function groups: Input, List, Action and Status.

The software automatically saves data of Transmit list when the program is closed. Restart program and the recorded data will be displayed in Transmit list.



- **Input**
  Enter proper parameters and click Add button to add data value into Transmit list. Or you can directly click on each item in Transmit list to update data. All items in Transmit list have default values and protection against out-of-range input data.



Port

This is the same CAN port specified in Connect Setting window.

IDLen

This is message ID type selection; 11-bit(CAN 2.0A) or 29-bit(CAN 2.0B).

ID

This is message ID in hexadecimal.

RTR

Determine whether RTR message is set or not. Note data length of RTR message without data field is 0.

Data Len

Transmit data length.

D0~D7

CAN data in hexadecimal.

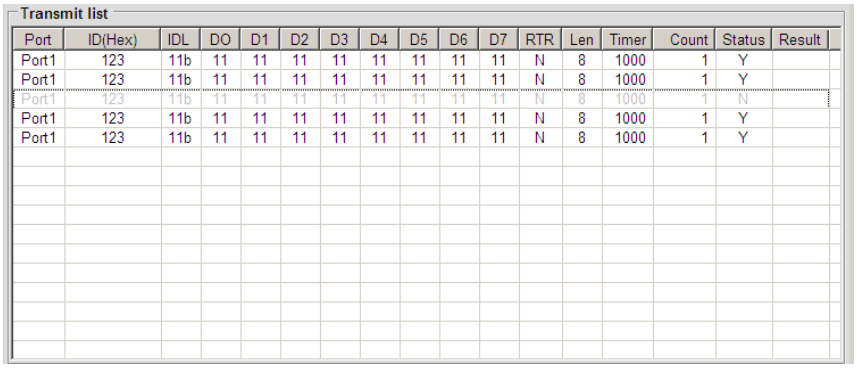
(HW) Timer

Transmit interval in millisecond. This item is only suitable for hardware (HW) send.

(HW) Count

Set the number of times the data is transmitted (for hardware (HW) send).

- **Transmit List**
  All added data is filled into below Transmit list.


Transmit list

Port	ID(Hex)	IDL	DO	D1	D2	D3	D4	D5	D6	D7	RTR	Len	Timer	Count	Status	Result
Port1	123	11b	11	11	11	11	11	11	11	11	N	8	1000	1	Y	
Port1	123	11b	11	11	11	11	11	11	11	11	N	8	1000	1	Y	
Port1	123	11b	11	11	11	11	11	11	11	11	N	8	1000	1	N	
Port1	123	11b	11	11	11	11	11	11	11	11	N	8	1000	1	Y	
Port1	123	11b	11	11	11	11	11	11	11	11	N	8	1000	1	Y	

Port

This is the same CAN port specified in Connect Setting window.

ID

This is message ID in hexadecimal.

IDL

This is message ID type selection; 11-bit(CAN 2.0A) or 29-bit(CAN 2.0B).

D0~D7

CAN data in hexadecimal.

RTR

Indicate whether RTR message is set or not.

Len

Transmit data length.

Timer

Transmit interval in millisecond.

Count

The number of times the data is transmitted.

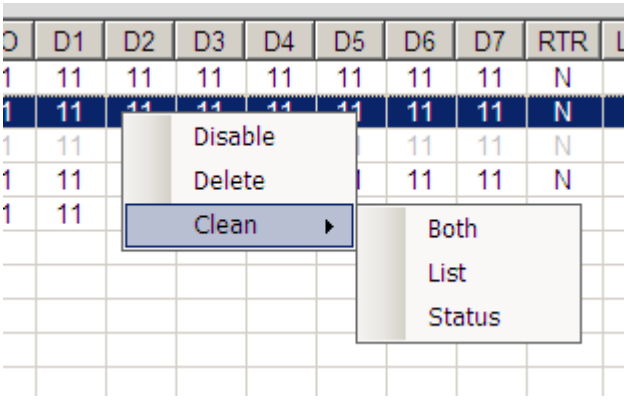
Status

This option is status of whether to transmit data or not. If disabled, data selected in Transmit list will show up in gray and will be ignored during data transmission.

Result

Show result of data transmission. If error occurred, double click (with mouse left button) on list item to display error message box. If no error occurred, you won't see any error message.

Right click on list item to show additional function.



Enable/Disable

Enable or disable selected row.

Delete

Delete selected row from list.

Clean\Both

Remove both; data and status data from selected row.

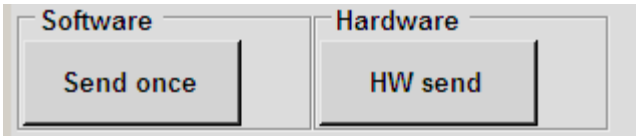
Clean\List

Remove data from selected row.

Clean\Status

Remove status data from selected row.

- **Action**



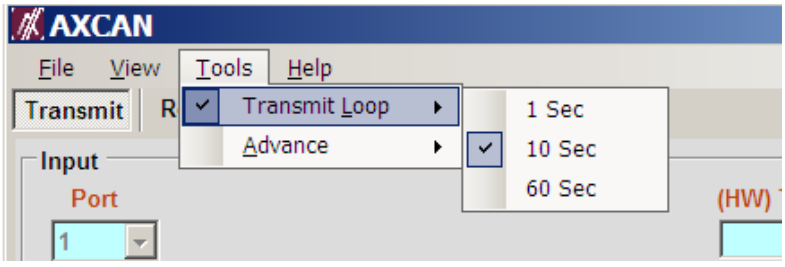
Send once

Click this button to send data in list regardless of (HW) Timer and (HW) Count settings.

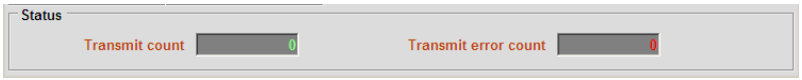
HW Send

Click this button to send data in list based on (HW) Timer and (HW) Count settings.

To transmit data continuously, check Tools menu\Transmit Loop\1 or 10 or 60 sec. Then click Send once or HW send button to transmit data repeatedly. The transmitting will not stop until Stop loop button is pressed.



- **Status**



Transmit count

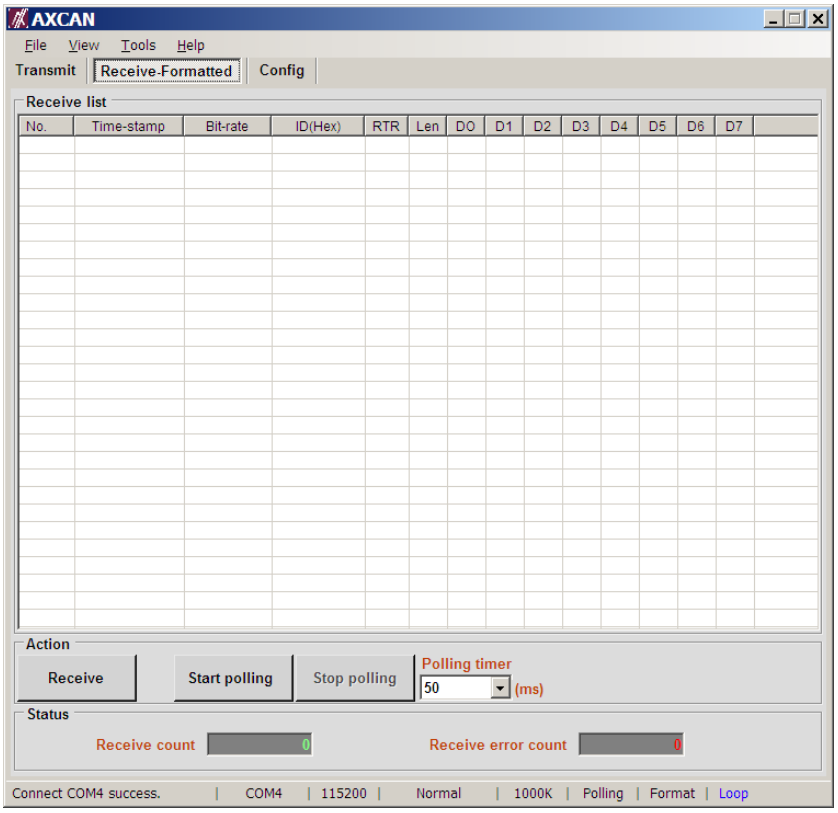
This is the total amount of transmitted data.

Transmit error count

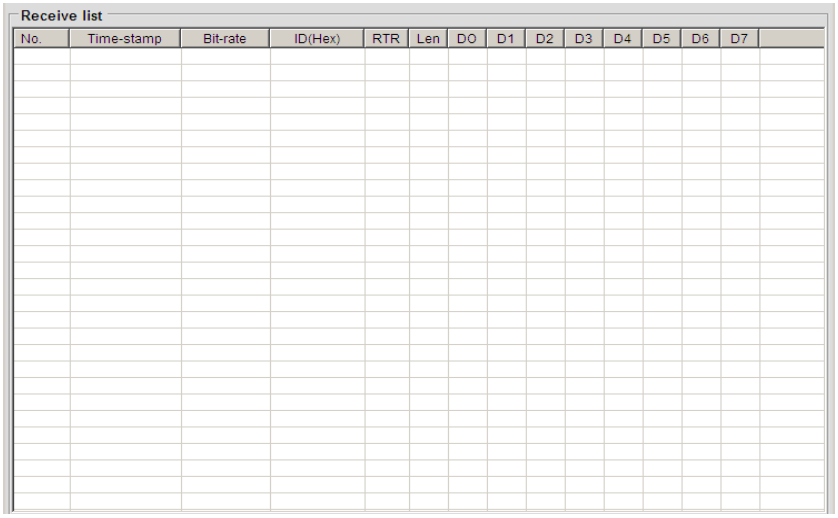
The amount of transmit errors.

5.5 Receive-Formatted Setting Window

If Rx buffer type is set to formatted data, this page switches to Receive-Formatted Setting page. This page consists of 3 function groups: List, Action and Status.



- **Receive List**
  Received data is shown in this list.



No.

Number of list item.

Time stamp

The time at which message is received by PC.

Bit rate

CAN communication bit rate.

ID

This is message ID in hexadecimal.

RTR

Indicate whether RTR message is set or not.

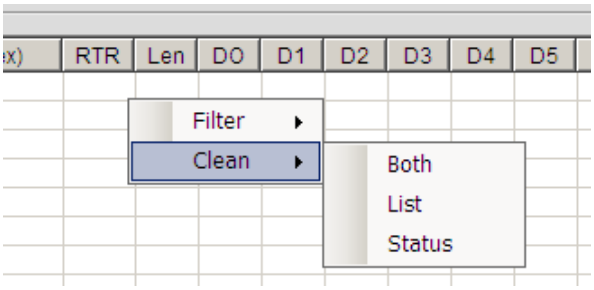
Len

Receive data length.

D0~D7

CAN data in hexadecimal.

Right click on list item to show additional function.



Filter

This function is for software filter setting. More detailed information is given below.

Clean\Both

Remove both; data and status data from selected row.

Clean\List

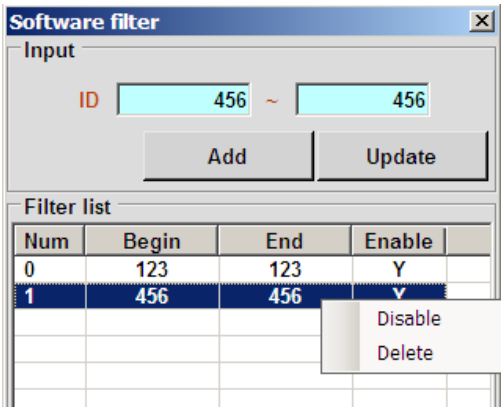
Remove data from selected row.

Clean\Status

Remove status data from selected row.

Software filter

Adds filters to block out of range values, so only the data in range will be shown in Receive list. The valid range of data is 0~1FFFFFFF (hex).



In addition, there is a right-click menu over the Filter list which allows you to choose Disable or Delete function.

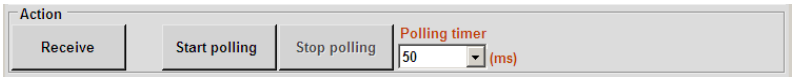
Enable/Disable

Enable or disable range filter.

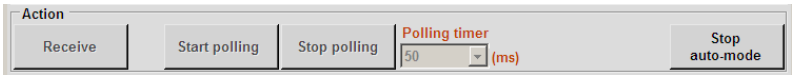
Delete

Remove the selected range filter.

- **Action**
  When the Rx buffer is in Polling mode, the Action page appears as follow.



When the Rx buffer is in Auto mode, the Action page appears as follow.



Receive

Click this button to request device to send data.

Start polling

Click this button to start polling. It requests device to send data continuously based on time interval in Polling timer.

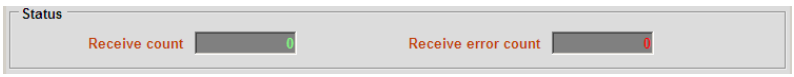
Stop polling

Click this button to stop polling.

Stop auto-mode

Click this button to stop Auto mode and switch back to Polling mode.

- **Status**



Receive count

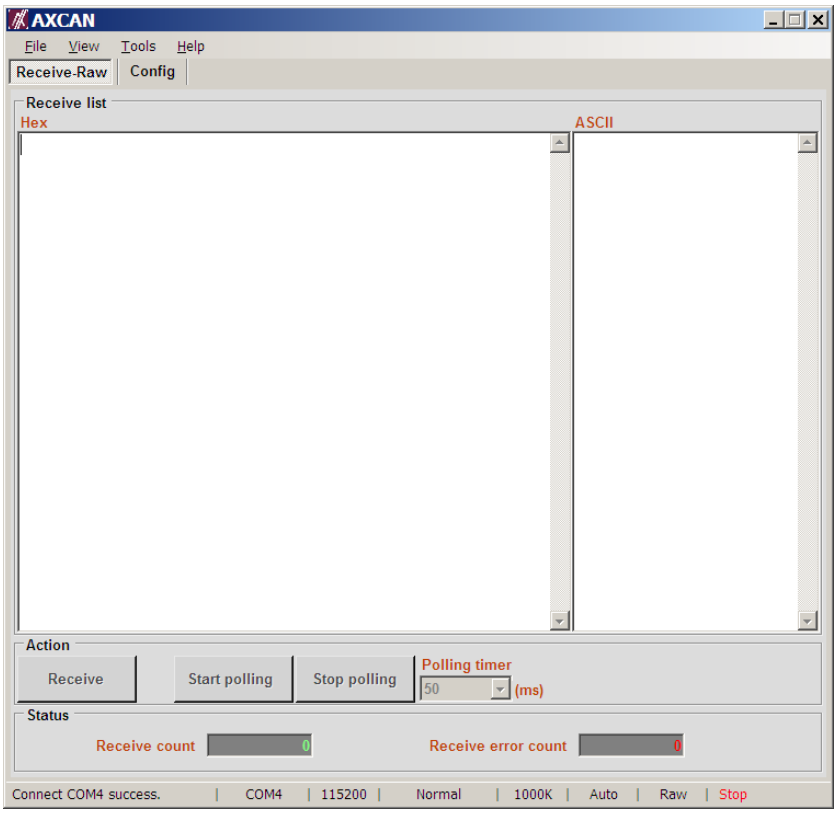
This is the total amount of received data.

Receive error count

The amount of receive errors.

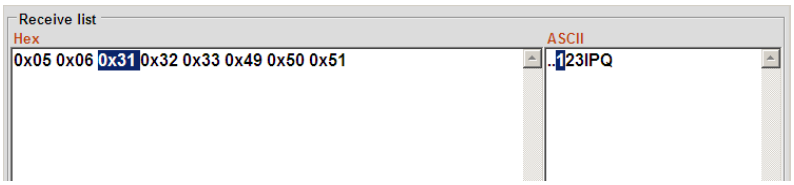
5.6 Receive-Raw Setting Window

If Rx buffer type is set to raw data, this page switches to Receive-Raw Setting page. This page consists of 3 function groups: List, Action and Status.

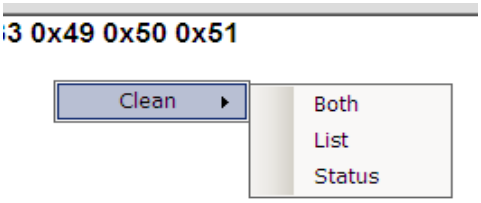


- List

  Received raw data (in hexadecimal and ASCII) is shown in this list.



Select Hex data and at the same time its corresponding ASCII data is also selected. Conversely, if you select ASCII data, its mapped Hex data is also selected. In addition, there is a right-click menu over the Receive list which allows you to use Clean function.



Clean\Both

Remove both; selected data and status of received data.

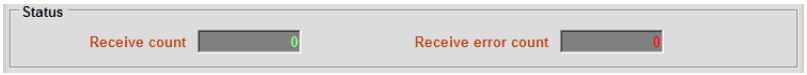
Clean\List

Remove selected data.

Clean\Status

Remove status of received data.

- **Status**



Receive count

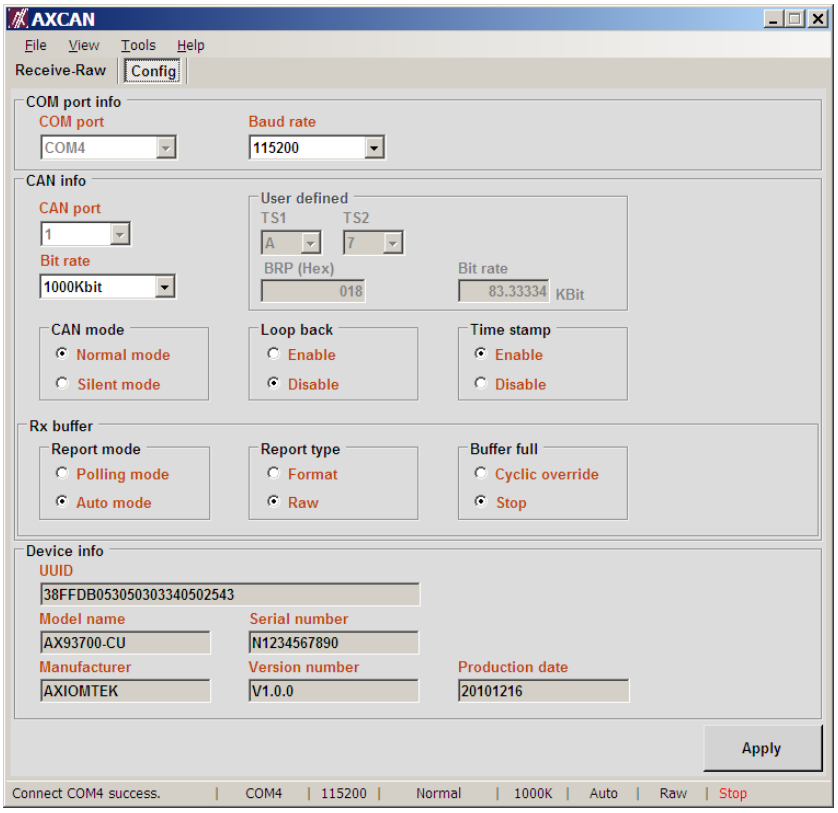
This is the total amount of received data.

Receive error count

The amount of receive errors.

5.7 Config Setting Window

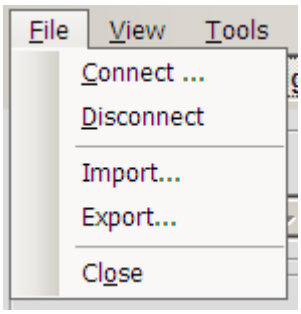
You can use functions in this window only if the connection is successful. This page consists of 2 function groups: Setting (refer to section 4.2 Connect Setting Window) and Device info.



- **Device info**
  It contains the following information: UUID, Model name, Serial number, Manufacturer, Version number and Production date.

5.8 Others

- **File Menu**



Connect

Click File\Connect menu to launch Connect window.

Disconnect

Click File\Disconnect menu to terminate current connection.

Import

Click File\Import menu to import setting file.

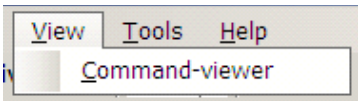
Export

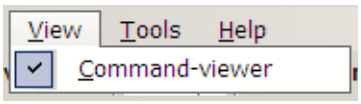
Click File\Export menu to store current settings into a file.

Close

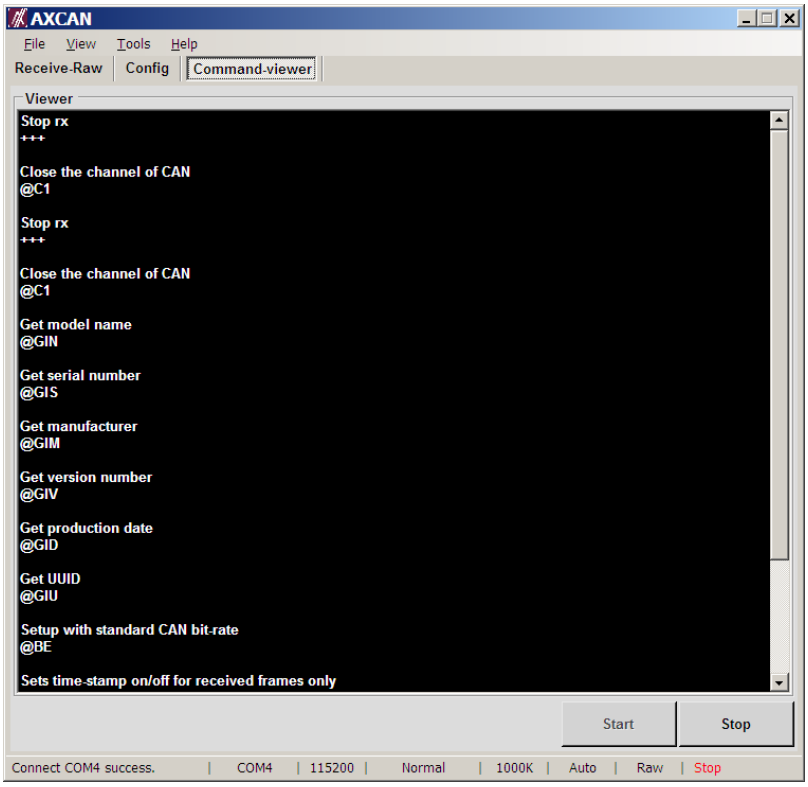
Click File\Close menu to exit program.

- **View Menu**



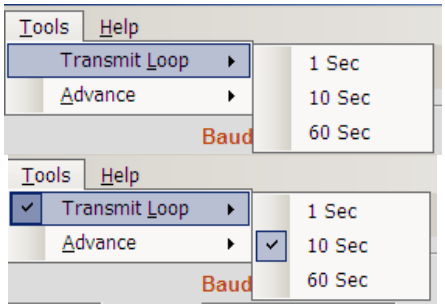


Click View\Command-viewer menu to open Command-viewer window. After the window is opened successfully, the Command-viewer item will be checked automatically.



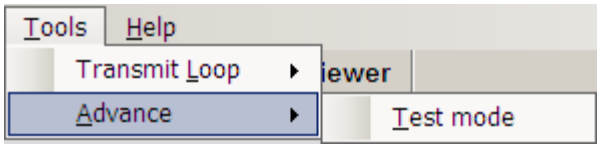
- **Tools Menu**

Transmit Loop

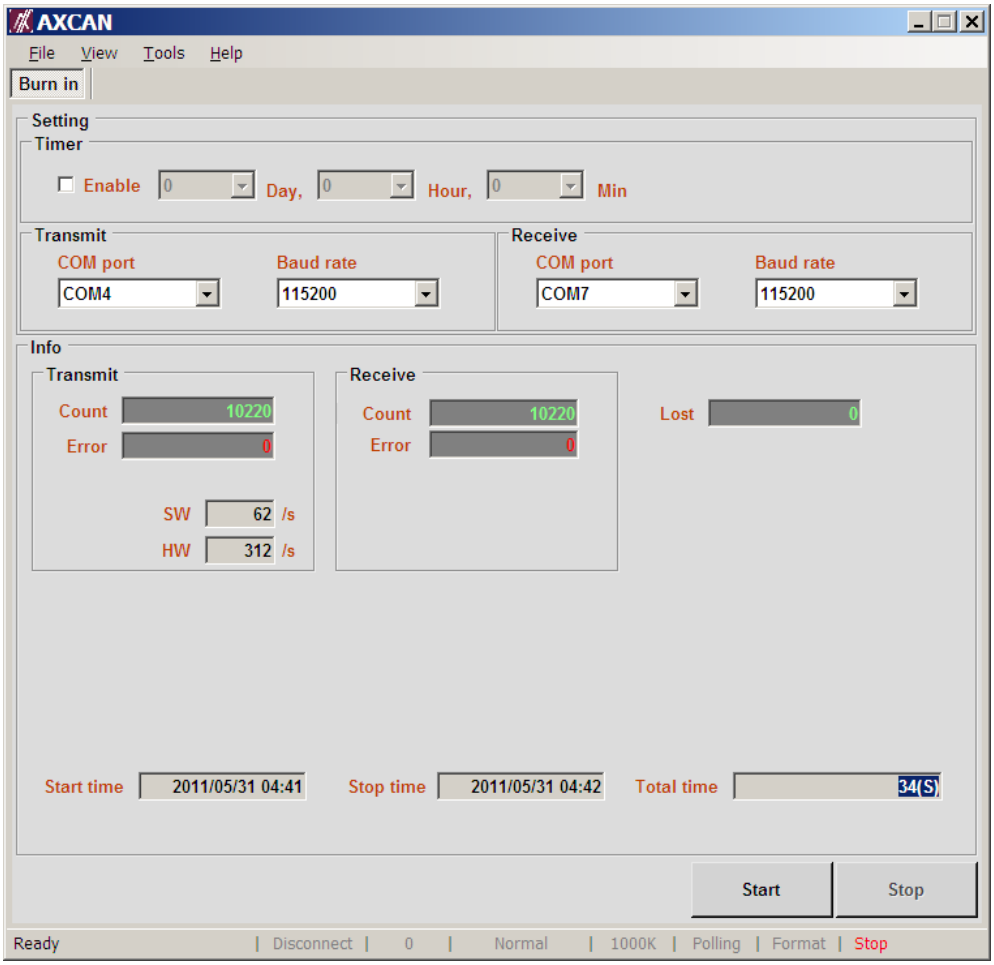


Select Tools\Transmit Loop\1 or 10 or 60 sec to trigger transmit loop function. After transmit loop has started, a check sign is added simultaneously.

Test Mode



Click Tools\Advance\Test mode to trigger burn in operation.



Timer

Enter timer value using the Day, Hour and Minute combo box. You can enable/disable the time duration of device testing. If this timer is enabled, the device testing stops at the end of the time duration. Or you can press Stop button to terminate immediately. If this timer is disabled, the device testing terminates only when Stop button is pressed.

Transmit and Receive

Please refer to section 4.2 Connect Setting Window.

Info\Transmit\Count

This is the total amount of transmitted data.

Info\Transmit\Error

The amount of transmit errors.

Info\Transmit\SW

This is the total amount of transmitted data per second via software (from USB port to device).

Info\Transmit\HW

This is the total amount of transmitted data per second via hardware (from device to device).

Info\Receive\Count

This is the total amount of received data.

Info\Receive\Error

The amount of receive errors.

Info\Lost

This is the total amount of messages lost.

Info\Start time

This is the start time information.

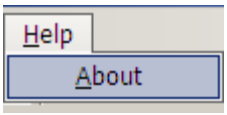
Info\Stop time

This is the stop time information.

Info\Total time

This is the total amount of burn in time.

- **Help Menu**



Help\About

Click Help\About menu to display About AXCAN window.

MEMO:

CHAPTER 6
CAN Commands Available

6.1 Overview

To meet user's application purpose, commands are provided for CAN module management, transmitting and receiving messages through rBOX103-FL. Each command consists of 3 parts: StartByte, ContentOfCommand and StopByte.

StartByte	ContentofCommand	StopByte
@	CMD	0x0d (carriage return)

Operation can be set to command and data mode. In command mode, CAN module accepts commands and this is the default mode. Data mode is the mode that only and automatically report CAN messages to UART port or USB port based on settings until user inputs command string '+++'.

Command Mode

In general, CAN module stays at command mode as default and accepts all commands.

Data Mode

Once CAN port is opened in auto report mode, it enters data mode and doesn't accept any command input except string '+++' in order to switch from data mode back to command mode.

6.2 Summary Table of All Commands

No.	Command	Description
1	Un	Set UART baud rate, where n is 0~A (Default: U7).
2	Bn	Set CAN bit rate, where n is 0~E and M (Default: BE).
3	bxyzzz	Set TS1, TS2 and BRP parameters for user-defined CAN bit rate, where x ,y and zzz are in hexadecimal.
4	Sx	Set report method, data format and receiving behavior if buffer is full (Default: S0).
5	Onxy	Open CAN port n with arguments x and y.
6	Cn	Close CAN port n.
7	tnpppprrrriiildd …	Transmit 2.0A CAN messages without RTR through CAN port n.
8	tnppprrrriii0R	Transmit 2.0A CAN messages with RTR bit 1 through CAN port n.
9	Tnppprrrriiiiiiiildd…	Transmit 2.0B CAN messages without RTR through CAN port n.
10	Tnppprrrriiiiiiii0R	Transmit 2.0B CAN messages with RTR bit 1 through CAN port n.
11	Tx	Inform CAN controller to stop transmitting messages if repeat counter is not zero.
12	Fnnxi..i	Set acceptance filter as identifier list mode.
13	Mnnxi..i	Apply mask mode to specified acceptance filter.
14	Wppxxxlldd…	Write data to NVRAM (64Kbyte in total).
15	Rppxxxlll	Read data from NVRAM.
16	Eppxxxlll	Erase NVRAM.
17	SC	Save settings to NVRAM.

No.	Command	Description
18	Zn	Enable timestamp of received messages.
19	SITnx	Configure termination of specified CAN port.
20	GITn	Read termination setting of specified CAN port.
21	SIEx	Configure the CAN Error LED.
22	+++	Escape from data mode to command mode.
23	SIB+++	Reset CAN interface (module).
24	GIx	Retrieve CAN system information.
25	Gx	Retrieve current CAN status and settings.
26	SRTnx	Set termination of specified COM port (rBOX103-FL only).
27	SRMnx	Set OP mode of specified COM port (rBOX103-FL only).
28	SREn	Activate SRTnx and SRMnx (rBOX103-FL only).
29	GRTn	Read termination of specified COM port (rBOX103-FL only).
30	GRMn	Read OP mode of specified COM port (rBOX103-FL only).

1. Command: Un

Command	Un
Description	Set UART baud rate, where n is 0~A (Default: U7). ■ This command is only available in command mode.
Arguments	@U0: 1200 bps @U1: 2400 bps @U2: 4800 bps @U3: 9600 bps @U4: 19200 bps @U5: 38400 bps @U6: 57600 bps @U7: 115200 bps @U8: 230400 bps @U9: 460800 bps @UA: 921600 bps
Example	@U6 Set UART baud rate to 57600 bps.
Return	OK or ERRORxx
Others	None

2. Command: Bn

Command	Bn
Description	Set CAN bit rate, where n is 0~E and M (Default: BE). ■ This command is only available in command mode. ■ This command must be used prior to open CAN port.
Arguments	@B0: 5 Kbit @B1: 10 Kbit @B2: 20 Kbit @B3: 40 Kbit @B4: 50 Kbit @B5: 80 Kbit @B6: 100 Kbit @B7: 125 Kbit @B8: 200 Kbit @B9: 250 Kbit @BA: 400 Kbit @BB: 500 Kbit @BC: 600 Kbit @BD: 800 Kbit @BE: 1000 Kbit @BM: User-defined
Example	@B4 Set CAN bit rate to 50 Kbit.
Return	OK or ERRORxx
Others	None

3. Command: bxyzzz

Command	bxyzzz
Description	Set TS1, TS2 and BRP parameters for user-defined CAN bit rate, where x ,y and zzz are in hexadecimal. ■ This command is only available in command mode. ■ This command must be used prior to open CAN port.
Arguments	x: TS2 (Time Segment 2), its data range is from 1 to 7. y: TS1 (Time Segment1), its data range is from 1 to F. zzz: BRP (Baud Rate Prescaler), its data range is from 1 to 3FF. Bit-rate = Fcl/(BRP(TS1+TS2+1)), where Fcl=36MHz.
Example	@b16012 Set TS2=0x1, TS1=0x6 and BRP=0x12, and calculate according to above formula. Result is the user-defined CAN bit rate = 250Kbit.
Return	OK or ERRORxx
Others	None

4. Command: Sx

Command	Sx
Description	Set report method, data format and receiving behavior if buffer is full (Default: S0). ■ This command is only available in command mode.
Arguments	x: Its data range is from 0 to 7 in hexadecimal. Bit[0]: Report method 0: Polling; report one message per polling 1: Auto; report automatically Bit[1]: Data format 0: Report formatted data 1: Report raw data Bit[2]: Receiving behavior if buffer is full. 0: Overwrite the old data 1: Suspend receiving until receiving space is available
Example	@S5 Set CAN to auto-report, report formatted data and overwrite buffer if it is full.
Return	OK or ERRORxx
Others	None

5. Command: Onxy

Command	Onxy
Description	Open CAN port n with arguments x and y. ■ This command is only available in command mode. ■ Before using this command, please make sure that the CAN port has been initialized via @Bn or @bxyzzz command.
Arguments	n: CAN port number, only 1 is allowed for rBOX103-FL series. x: Enable\disable silent mode. Set\unset CAN port as transmit-only. 0: Disable silent mode. This is the default normal mode. 1: Enable silent mode. CAN port is not allowed to receive messages. y: Enable\disable loopback mode. 0: Disable loopback mode 1: Enable loopback mode
Example	@O101 Open CAN port 1 and set it to operate at normal mode with loopback.
Return	OK or ERRORxx
Others	None

6. Command: Cn

Command	Cn
Description	Close CAN port n ■ This command is only available in command mode.
Arguments	n: CAN port number, only 1 is allowed for rBOX103-FL series.
Example	@C1 Close CAN port 1
Return	OK or ERRORxx
Others	None

7. Command: tnpppprrrriiildd...

Command	**tnpppprrrriiildd...**	
Description	Transmit 2.0A CAN messages without RTR through CAN port n. ■ This command is only available in command mode. ■ Command is available only if CAN port has opened.	
Arguments	n: CAN port number, only 1 is allowed for rBOX103-FL series.	
	pppp: rrrr: iii: l: dd:	Transmission intervals in hexadecimal. Its range is 0000~FFFF. Send one CAN message every pppp * 0.1 ms for rrrr times. Unit: 100 us (0.1 ms). Repeat counter in hexadecimal. Its range is 0000~FFFF. 0000: Send once Identifier in hexadecimal. Its range is 000~7FF. Data length in hexadecimal. Its range is 0~8. One data byte in hexadecimal. Its range is 00~FF. dd fields must match the setting of data length l.
Example 1	@t10000000010021133 Send one 2.0A CAN message with 11-bit ID 0x100, 2 bytes data 0x11 and 0x33 through CAN port 1.	
Example 2	@t100010005002133 Send one 2.0A CAN message with 11-bit ID=0x002 and 1 byte data 0x33 every 0.1ms for 5 times through CAN port 1.	
Return	OK or ERRORxx	
Others	The @GR command can be used to pull data out of receive buffer.	

8. Command: tnpppprrrriii0R

Command	**tnpppprrrriii0R**	
Description	Transmit 2.0A CAN messages with RTR bit 1 through CAN port n. ■ This command is only available in command mode. ■ Command is available only if CAN port has opened.	
Arguments	n: CAN port number, only 1 is allowed for rBOX103-FL series.	
	pppp: rrrr: iii:	Transmission intervals in hexadecimal. Its range is 0000~FFFF. Send one CAN message every pppp * 0.1 ms for rrrr times. Unit: 100 us (0.1 ms). Repeat counter in hexadecimal. Its range is 0000~FFFF. 0000: Set repeat counter to one. Identifier in hexadecimal. Its range is 000~7FF.
Example	@t1000000011000R Send one 2.0A CAN message with 11-bit ID 0x100 and RTR bit 1 through CAN port 1. Note this command sends message without data field which means the data length is zero.	
Return	OK or ERRORxx	
Others	The @GR command can be used to pull data out of receive buffer.	

9. Command: Tnpppprrrriiiiiiiildd...

Command	**Tnpppprrrriiiiiiiildd...**	
Description	Transmit 2.0B CAN messages without RTR through CAN port n. ■ This command is only available in command mode. ■ Command is available only if CAN port has opened.	
Arguments	n: CAN port number, only 1 is allowed for rBOX103-FL series.	
	pppp: rrrr: iiiiiiii: l: dd:	Transmission intervals in hexadecimal. Its range is 0000~FFFF. Send one CAN message every pppp * 0.1 ms for rrrr times. Unit: 100 us (0.1 ms). Repeat counter in hexadecimal. Its range is 0000~FFFF. 0000: Send once Identifier in hexadecimal. Its range is 00000000~1FFFFFFF. Data length in hexadecimal. Its range is 0~8. One data byte in hexadecimal. Its range is 00~FF. dd fields must match the setting of data length l.
Example 1	@T10000000000004567836162 65 Send one 2.0B CAN message with 29-bit ID 0x00045678, 3 bytes data 0x61, 0x62 and 0x65 through CAN port 1.	
Example 2	@T10001000501020304321222 3 Send one 2.0B CAN message with 29-bit ID=0x01020304 and 3 bytes data 0x21, 0x22 and 0x23 every 0.1ms for 5 times through CAN port 1.	
Return	OK or ERRORxx	
Others	The @GR command can be used to pull data out of receive buffer.	

10. Command: Tnpppprrrriiiiiii0R

Command	**Tnpppprrrriiiiiii0R**	
Description	Transmit 2.0B CAN messages with RTR bit 1 through CAN port n. ■ This command is only available in command mode. ■ Command is available only if CAN port has opened.	
Arguments	n: CAN port number, only 1 is allowed for rBOX103-FL series.	
	pp pp:	Transmission intervals in hexadecimal. Its range is 0000~FFFF. Send one CAN message every pppp * 0.1 ms for rrrr times. Unit: 100 us (0.1 ms).
	rrrr :	Repeat counter in hexadecimal. Its range is 0000~FFFF. 0000: Set repeat counter to one.
	iiiiii ii:	Identifier in hexadecimal. Its range is 00000000~1FFFFFFF.
Example	@T100000000123456780R Send one 2.0B CAN message with 29-bit ID 0x12345678 and RTR bit 1 through CAN port 1. Note this command sends message without data field, which means the data length is zero.	
Return	OK or ERRORxx	
Others	The @GR command can be used to pull data out of receive buffer.	

11. Command: Tx

Command	Tx
Description	Inform CAN controller to stop transmitting messages if repeat counter is not zero. ■ This command is only available at command mode. ■ Command is available only if CAN port has been opened.
Arguments	None
Example	@Tx Stop transmitting if repeat counter is not zero.
Return	OK or ERRORxx
Others	None

12. Command: Fnnxi..i

Command	Fnnxi..i
Description	Set acceptance filter as identifier list mode. ■ This command is only available in command mode. ■ Command is available only if CAN port is not opened.
Arguments	nn: Index of filter in hexadecimal. Its data range is 00~1B. x: Format of identifier. Its data range is 0~1. 0: Standard ID (11-bit) 1: Extend ID (29-bit) i..i: Identifier
Example 1	@F000111 Set filter index 0 as identifier list mode for and accept identifier 0x111 only.
Example 2	@F00112345678 Set filter index 0 as identifier list mode for and accept identifier 0x12345678 only.
Returns	OK or ERRORxx
Others	■ Remember to close CAN port with the @C1 before using this command. ■ Filter index 0x0 has been set as mask mode with identifier id 0 by default. If you want to enable some filters at identifier list mode, please do remember to set index to any other value except 0x00. Otherwise, messages won't be filtered out because of this default mask mode filter. ■ For more detailed information, please refer to section 5.3 Identifier Filtering.

13. Command: Mnnxi..i

Command	Mnnxi..i
Description	Apply mask mode to specified acceptance filter. ■ This command is only available in command mode. ■ Command is available only if CAN port is opened.
Arguments	nn: Index of filter in hexadecimal. Its data range is 00~1B. x: Format of identifier. Its data range is 0~1. 0: Standard ID (11-bit) 1: Extend ID (29-bit) i..i: Identifier mask value 0: Don't care. The bit of identifier is not used for comparison. 1: Must match. The bit of the incoming identifier must have the same level.
Example	@F000123 and @M000FF0 combination. Set standard acceptance identification #0; only accepts incoming messages with identifiers from range 0x120 to 0x12F.
Returns	OK or ERRORxx
Others	■ Remember to close CAN port with the @C1 command before applying mask mode. ■ Filter index 0x0 has been set as mask mode with identifier id 0 by default. If you want to enable some filters at identifier list mode, please do remember to set index to any other value except 0x00. Otherwise, no message will be filtered out because of this default mask mode filter. ■ For more detailed information, please refer to section 5.3 Identifier Filtering.

14. Command: Wppxxxllldd…

Command	Wppxxxllldd…
Description	Write data to NVRAM (64Kbyte in total) ■ This command is only available in command mode. ■ Command is available only if CAN port is not opened.
Arguments	pp: Number of page (2KB/page) written in hexadecimal. Its data range is 00~1F. xxx: Offset in hexadecimal. Its data range is 000~7FF. lll: Data length in hexadecimal. Its data range is 001~800. dd: Data byte in hexadecimal. Its data range is 00~FF. Note dd must repeat for lll times.
Example 1	@ W00000002AA55 Write 2 bytes of data 0xAA and 0x55 to NVRAM at page 0 with offset 0x0.
Example 2	@W030600053132333435 Write 5 bytes of data 0x31, 0x32, 0x33, 0x34 and 0x35 to NVRAM at page 03 with offset 0x060.
Returns	OK or ERRORxx
Others	None

15. Command: Rppxxxlll

Command	Rppxxxlll
Description	Read data from NVRAM. ■ This command is only available in command mode. ■ Command is available only if CAN port is not opened.
Arguments	pp: Number of page (2KB/page) written in hexadecimal. Its data range is 00~1F. xxx: Offset in hexadecimal. Its data range is 000~7FF. lll: Data length in hexadecimal. Its data range is 001~800.
Example 1	@ R00000002 Read 2 bytes from of NVRAM at page 0 with offset 0x0.
Example 2	@R03060005 Read 5 bytes from NVRAM at page 03 with offset 0x060.
Others	Note the return value will display in hexadecimal with 'R' as prefix character.

16. Command: Eppxxxlll

Command	Eppxxxlll
Description	Erase NVRAM ■ This command is only available in command mode. ■ Command is available only if CAN port is not opened.
Arguments	pp: Number of page (2KB/page) written in hexadecimal. Its data range is 00~1F. xxx: Offset in hexadecimal. Its data range is 000~7FF. lll: Data length in hexadecimal. Its data range is 001~800.
Example	@ E00000002 Erase 2 bytes of NVRAM from page 0 with offset 0x0.
Returns	OK or ERRORxx
Others	Note the return value will display in hexadecimal with 'R' as prefix character.

17. Command: SC

Command	SC
Description	Save settings to NVRAM. The settings include: 1. TimeStamp. 2. Data report method of CAN port. 3. Receiving behavior if buffer is full. 4. Enable/disable timestamp information (refer to @Zn command) 5. Baudrate of COM port ■ This command is only available in command mode.
Arguments	None
Example	@SC
Returns	OK or ERRORxx
Others	None

18. Command: Zn

Command	Zn
Description	Enable timestamp of received messages. ■ This command is only available in command mode. ■ Command is available only if CAN port is not opened.
Arguments	n: Enable/disable timestamp 0: Disable (default) 1: Enable
Example	@Z0 Disable timestamp.
Returns	OK or ERRORxx
Others	None

19. Command: SITnx

Command	SITnx
Description	Configure termination of specified CAN port. ■ This command is only available in command mode.
Arguments	n: CAN port number x: Enable/disable termination 0: Disable termination 1: Enable termination
Example	@SIT11 Enable termination of CAN port 1.
Returns	OK or ERRORxx
Others	This command applies only to rBOX103-FL series.

20. Command: GITn

Command	GITn
Description	Read termination setting of specified CAN port. ■ This command is only available in command mode.
Arguments	n: CAN port number
Example	@GIT1 Must return #T0 or #T1.
Returns	#T0(Disabled) or #T1(Enabled)
Others	This command applies only to rBOX103-FL series.

21. Command: SIEx

Command	SIEx
Description	Configure the CAN Error LED. ■ This command is only available in command mode.
Arguments	x: Turn on/off CAN Error LED. 0: Turn off 1: Turn on
Example	@SIE0 Turn off the CAN Error LED.
Returns	OK or ERRORxx
Others	None

22. Command: +++

Command	+++
Description	Escape from data mode to command mode. ■ This command is only available in data mode.
Arguments	None
Example	+++ Escape from data mode to command mode
Returns	None
Others	After sending characters '+++', user can send 0x0d carriage return to see whether string '#OK' shows on terminal or not. If '#OK' appears, it means device is already in command mode.

23. Command: SIB+++

Command	SIB+++
Description	Reset CAN interface (module). ■ This command is only available in command mode.
Arguments	None
Example	@SIB+++ Module reboots.
Returns	Rebooting…!
Others	None

24. Command: GIx

Command	GIx
Description	Retrieve CAN system information. ■ This command is only available in command mode.
Arguments	x: Its definition is as follows: N: Model name S: Serial number U: Unique ID(UUID) M: Manufacturer V: Version D: Production Date
Example	@GIV Retrieve version information.
Returns	V2.1.2
Others	None

25. Command: Gx

Command	Gx
Description	Retrieve current CAN status and settings. ■ This command is only available in command mode.
Arguments	x: Its definition is as follows: -O: Retrieve open mode settings of CAN port for comparing with the settings of @Onxy command. -U: Retrieve current baud rate of COM port for comparing with the setting of @Un command. -B: Retrieve current bit rate of CAN port for comparing with the setting of @Bn command. -S: Retrieve settings of CAN for comparing with the settings of @Sx command. -Fnn: Retrieve settings of acceptance filter (list mode) nn for comparing with the settings of @Fnnxiii… command. -Mnn: Retrieve settings of acceptance filter (mask mode) nn for comparing with the settings of @Mnnxiii… command. -Z: Retrieve setting of timestamp for comparing with the setting of @Zn command. -R: Retrieve one message out of receive buffer. -E: Retrieve the latest error code.

Command	Gx
Returns	@GO: Refer to command description for more details, e.g.: O100. @GU: U1200, U2400, U4800, U9600, U19200, U38400, U57600, U115200, U230400, U460800 or U921600. @GB: Refer to command description for more details, e.g.: B0, B1…or B7. @GS: Refer to command description for more details, e.g.: S0, S1…or S7. @GFnn: Refer to command description for more details. @GMnn: Refer to command description for more details. @GZ: Refer to command description for more details, e.g.: Z0 or Z1. @GR: Please refer to section 5.4 Data Format for details. @GE: A prefix character of 'E' plus a 4-byte value indicate the latest error status. Bit[24:31] : REC - Receive Error Counter. Bit[16:23] : TEC - Transmit Error Counter. Bit[07:15] : Reserved. Bit[04:06] : LEC - Last Error Code. 000: No error. 001: Stuff error. 010: Form error. 011: Acknowledgment error. 100: Bit recessive error. 101: Bit dominant error. 110: CRC error. 111: Reserved. Bit[3] : Reserved. Bit[2] : Bus off flag. Bit[1] : Error passive flag (REC > 127 or TEC > 127). Bit[0] : Error warning flag (REC >= 96 or TEC >= 96).
Others	None

26. Command: SRTnx

Command	SRTnx
Description	Set termination of specified COM port. ■ This command is only available in command mode. ■ In RS232 mode, you can't enable termination. ■ This command must be used with SREn. ■ For iCON101-CS only.
Arguments	n: COM port number, only 1 is allowed for rBOX103-FL series. x: Enable/disable termination. 0: Disable termination. 1: Enable termination.
Example	@SRT11 @SRE1 Enable termination of COM1.
Returns	OK or ERRORxx
Others	None

27. Command: SRMnx

Command	SRMnx
Description	Set OP mode of specified COM port. ■ This command is only available in command mode. ■ This command must be used with SREn. ■ For iCON101-CS only.
Arguments	n: COM port number, only 1 is allowed for rBOX103-FL series. x: OP mode 0: RS232 1: RS422 2: RS485
Example	@SRM10 @SRE1 Set COM1 to RS232 mode.
Returns	OK or ERRORxx
Others	None

28. Command: SREn

Command	SREn
Description	Activate SRTnx and SRMnx. ■ This command is only available in command mode. ■ This command must be used with SRTnx and SRMnx. ■ For iCON101-CS only.
Arguments	n: COM port number, only 1 is allowed for rBOX103-FL series.
Example	@SRT11 @SRM11 @SRE1 Set COM1 to RS422 mode and enable termination of COM1. At last activate it.
Returns	OK or ERRORxx
Others	None

29. Command: GRTn

Command	GRTn
Description	Read termination of specified COM port. ■ This command is only available in command mode. ■ For rBOX103-FL only.
Arguments	n: COM port number, only 1 is allowed for rBOX103-FL series.
Example	@GRT1 Get termination status of COM1.
Returns	T0
Others	None

30. Command: GRMn

Command	GRMn
Description	Read OP mode of specified COM port. ■ This command is only available in command mode. ■ For rBOX103-FL only.
Arguments	n: COM port number, only 1 is allowed for rBOX103-FL series.
Example	@GRM1 Get OP mode of COM1.
Returns	M0
Others	None

6.3 Identifier Filtering

Each CAN port provides 14 configurable identifier filters for selecting the incoming message the software needs and discarding the others. Filters can be configured in mask mode or in identifier list mode.

Mask mode

In mask mode the identifier registers are associated with mask registers specifying which bits of the identifier are handled as "must match" or as "don't care".

Identifier list mode

In identifier list mode, the mask registers are used as identifier registers. Thus instead of defining an identifier and a mask, two identifiers are specified, doubling the number of single identifiers. All bits of the incoming identifier must match the bits specified in the filter registers.

Note: ***Filter index 0x0 has been set as mask mode with identifier id 0 by default, which means all CAN messages will not be filtered out.***

6.4 Data Format

Raw Data:

Raw data in hexadecimal

Formatted Data:

Standard CAN 2.0A

Byte	1	1	4	1	3	1	1	Data Len*2	1
	@	F	stamp	0	ID	RTR	Data Len	Data	0x0D

Extended CAN 2.0B

Byte	1	1	4	1	3	1	1	Data Len*2	1
	@	F	stamp	1	ID	RTR	Data Len	Data	0x0D

6.5 Error Code

Error No.	Error Code	Description
0	OK	No error.
1	ERROR01	CAN has already been opened.
2	ERROR02	Error detected in opening CAN port.
3	ERROR03	CAN is not open.
4	ERROR04	CAN bit time is not set.
5	ERROR05	CAN Tx buffer is full.
6	ERROR06	CAN buffer is empty.
7	ERROR07	CAN device does not exist.
8	ERROR08	Command error.
9	ERROR09	Flash error.
10	ERROR10	Argument error.

6.6 How to Send Commands via Hyperterminal

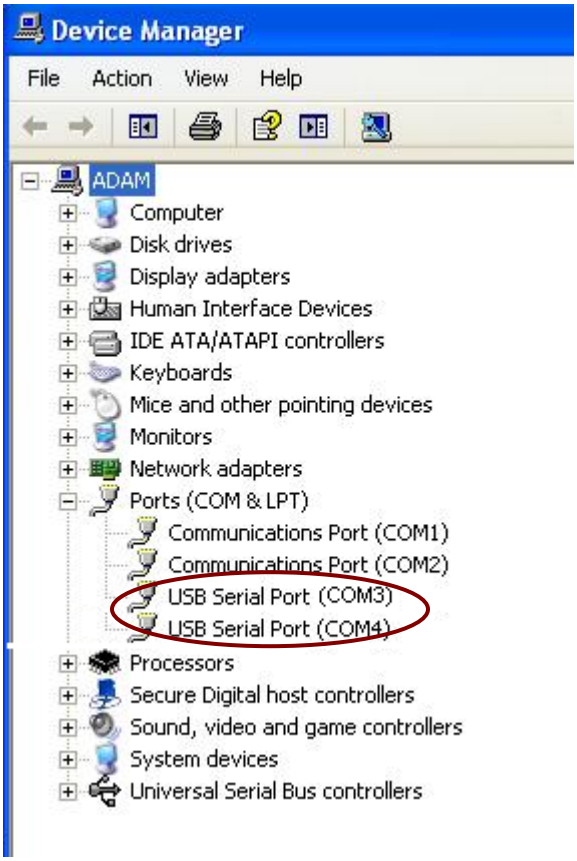
You can use hyperterminal program to send and retrieve command messages from

rBOX103-FL . Before you start, please do:

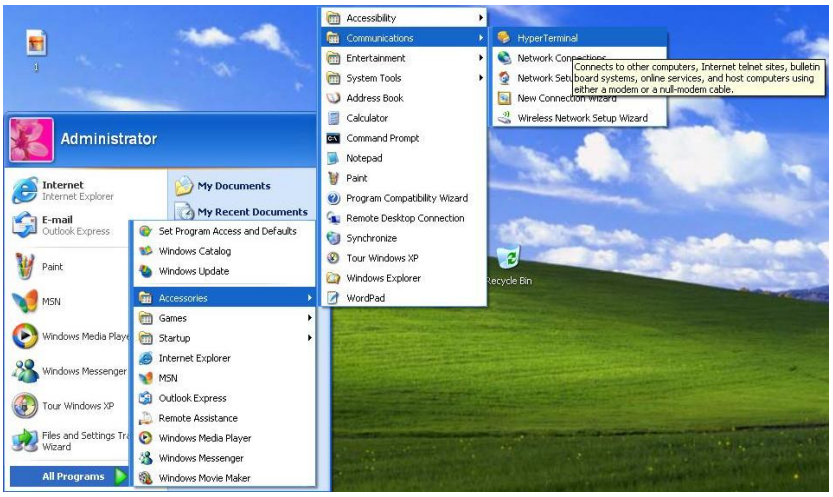
- Firmly connect the rBOX103-FL 's CAN interface connector to CAN device.

Below we provide brief guide of how to configure hyperterminal and how to send commands via hyperterminal.

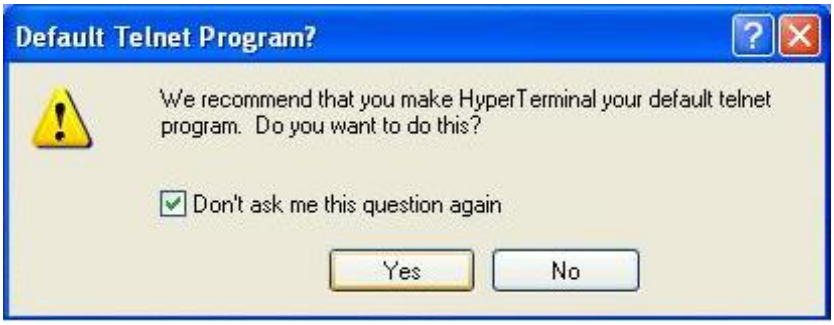
1. Go to Device Manager and check for USB serial port no. of your rBOX103-FL . In this example, the port no. is COM3 or COM4 (see below image).


Device Manager
File
Action
View
Help
ADAM
Computer
Disk drives
Display adapters
Human Interface Devices
IDE ATA/ATAPI controllers
Keyboards
Mice and other pointing devices
Monitors
Network adapters
Ports (COM & LPT)
Communications Port (COM1)
Communications Port (COM2)
USB Serial Port (COM3)
USB Serial Port (COM4)
Processors
Secure Digital host controllers
Sound, video and game controllers
System devices
Universal Serial Bus controllers

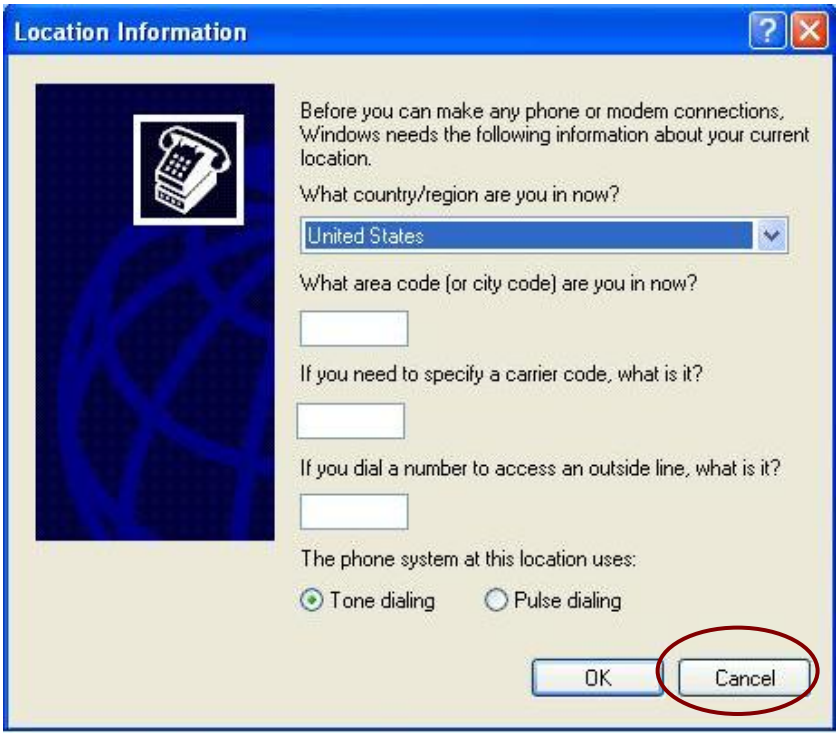
2. Go to All Programs\Accessories\Communications, and click the Hyperterminal to open program.



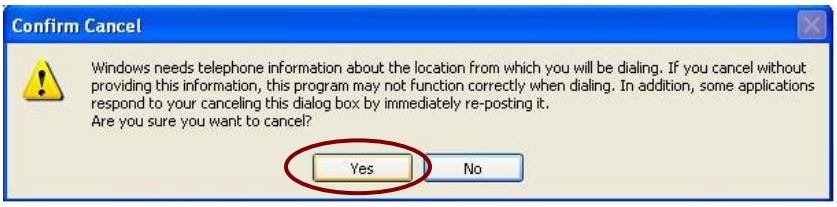
3. The next window appears, click Yes to go to next step.


Default Telnet Program?
We recommend that you make HyperTerminal your default telnet program. Do you want to do this?
Don't ask me this question again
Yes
No

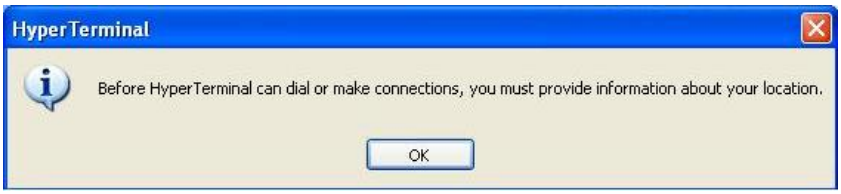
4. When you see below window, just click Cancel to proceed.


Location Information
Before you can make any phone or modem connections, Windows needs the following information about your current location.
What country/region are you in now?
United States
What area code (or city code) are you in now?
If you need to specify a carrier code, what is it?
If you dial a number to access an outside line, what is it?
The phone system at this location uses:
Tone dialing
Pulse dialing
OK
Cancel

5. A window appears to confirm the cancellation. Click Yes to continue.

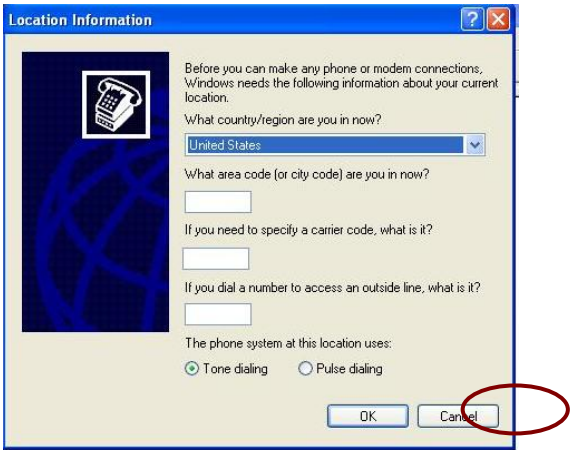

Confirm Cancel
Windows needs telephone information about the location from which you will be dialing. If you cancel without providing this information, this program may not function correctly when dialing. In addition, some applications respond to your canceling this dialog box by immediately re-posting it.
Are you sure you want to cancel?
Yes
No

6. Below window appears to remind you to enter information about your location. Click OK.

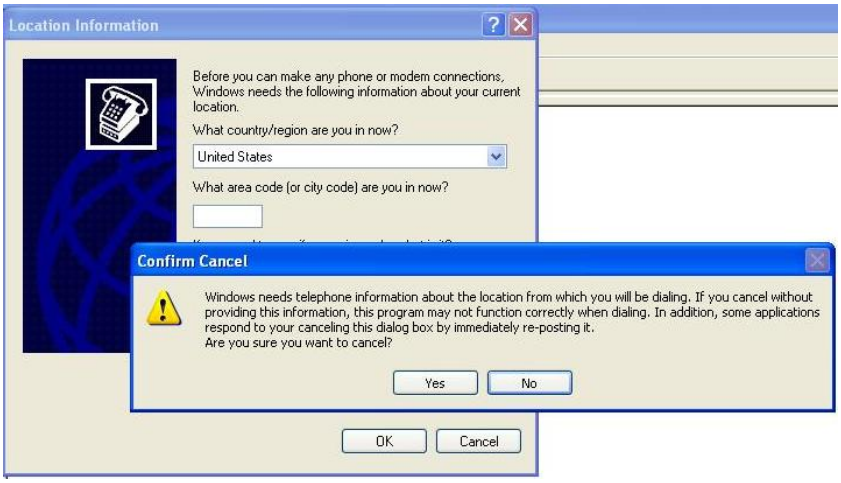

HyperTerminal
Before HyperTerminal can dial or make connections, you must provide information about your location.
OK

7. Enter a name and choose an icon for the new connection. Then click OK.

8. The Location Information window appears. Click Cancel.


Location Information
Before you can make any phone or modem connections, Windows needs the following information about your current location.
What country/region are you in now?
United States
What area code (or city code) are you in now?
If you need to specify a carrier code, what is it?
If you dial a number to access an outside line, what is it?
The phone system at this location uses:
Tone dialing
Pulse dialing
OK
Cancel

9. The next window appears. Click Yes.

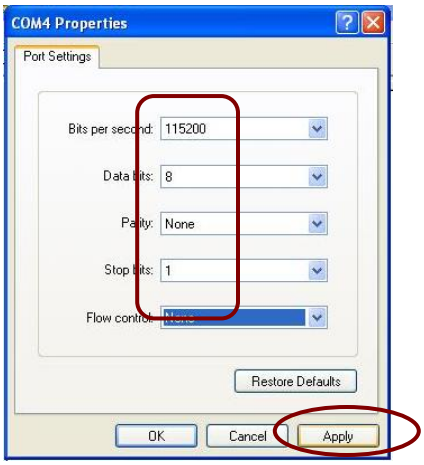

Location Information
Before you can make any phone or modem connections, Windows needs the following information about your current location.
What country/region are you in now?
United States
What area code (or city code) are you in now?
Confirm Cancel
Windows needs telephone information about the location from which you will be dialing. If you cancel without providing this information, this program may not function correctly when dialing. In addition, some applications respond to your canceling this dialog box by immediately re-posting it.
Are you sure you want to cancel?
Yes
No
OK
Cancel

10. When you see below popup window, please click OK.

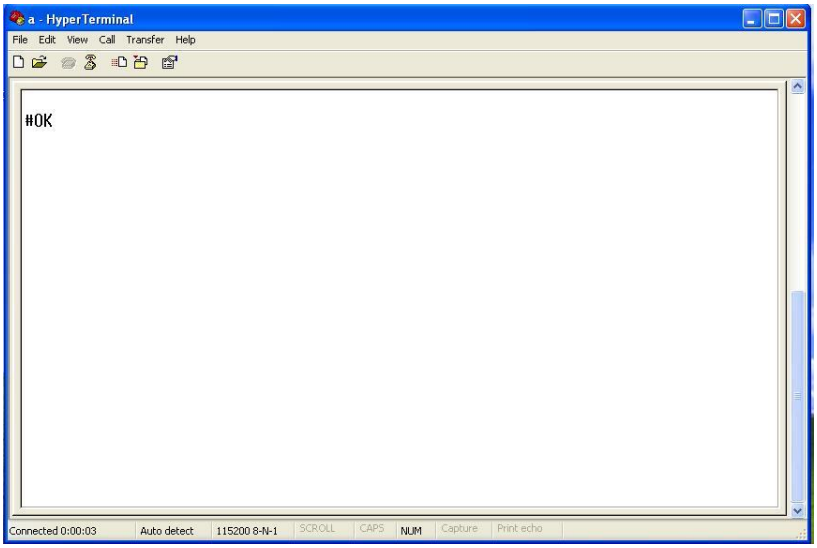
HyperTerminal
Before HyperTerminal can dial or make connections, you must provide information about your location.
OK

11. Select COM4 (refer to above step 1) for the serial port no. and click OK.

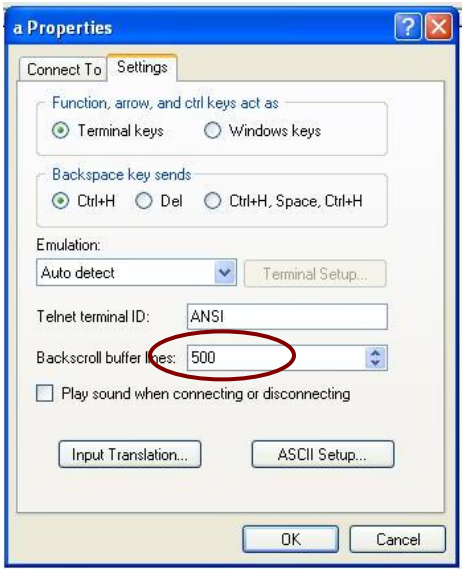
12. Enter COM4 properties according to below instructions. Then click Apply to connect.



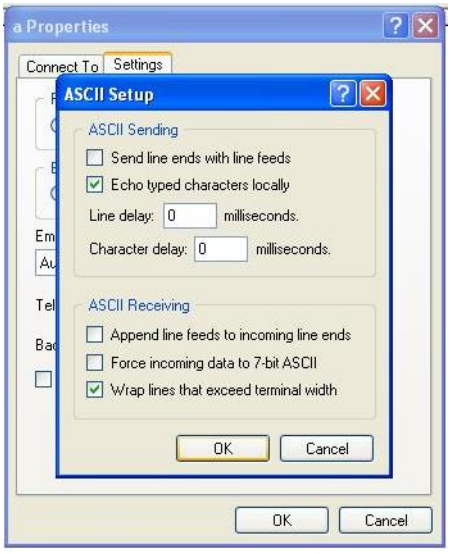
13. Verify the connection between your computer and rBOX103-FL . Key in <Enter> and the iCON-101CU should return "#OK".



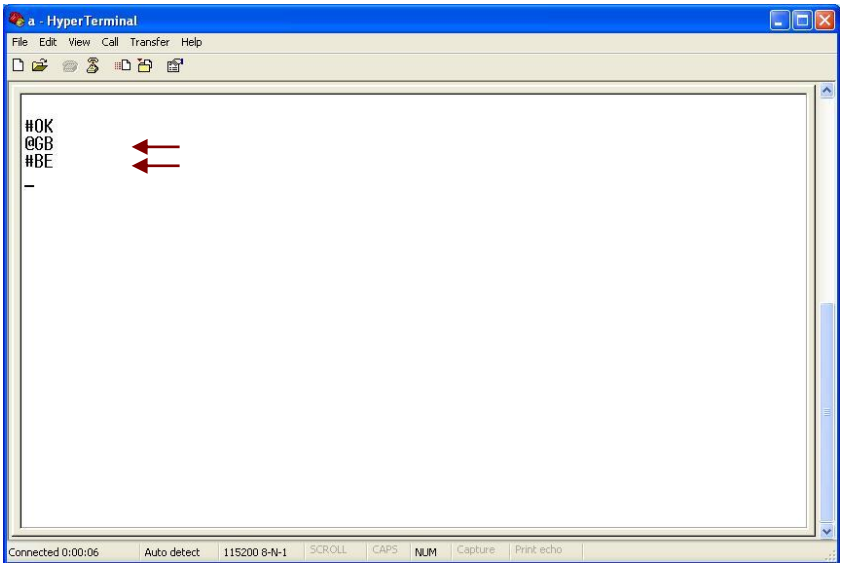
14. You should change some settings for sending AT commands. In the Properties page of hyperterminal, select Settings tab. Press the ASCII Setup button.



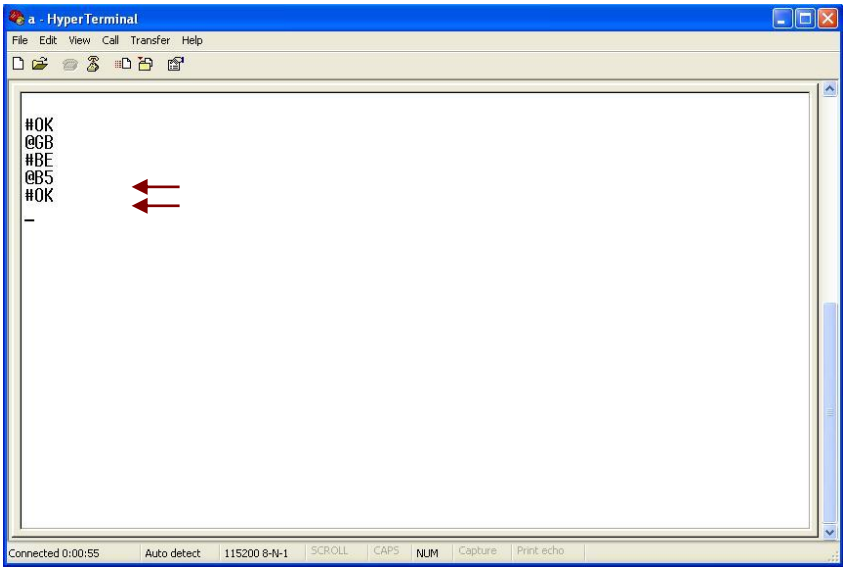
15. Follow the instructions in below image to configure ASCII settings and click OK.



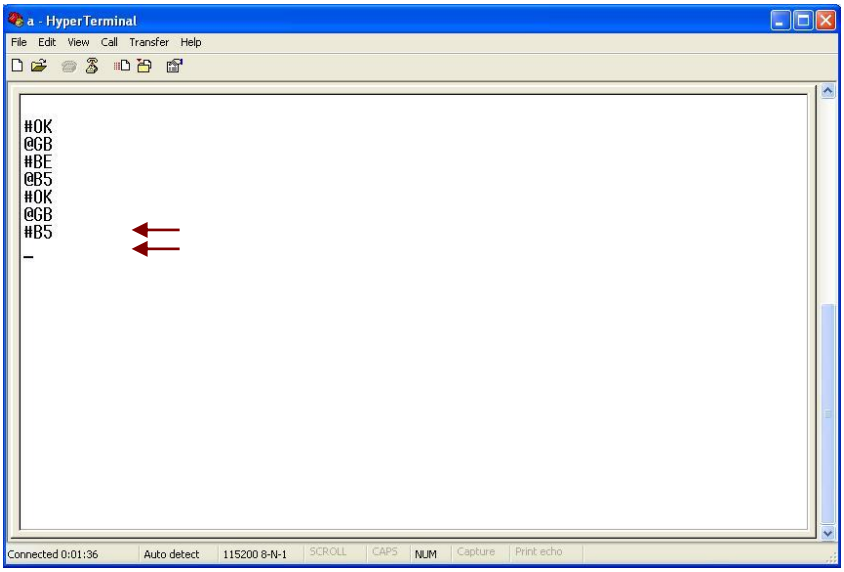
16. After completing previous step, you should be able to enter AT command. Key in "@GB" to retrieve bit rate of CAN port. In this example, "#BE" is returned from CAN port.



17. With the same method as in the previous step, you can change bit rate setting. Key in "@B5" to set CAN bit rate to 80KB. If no error occurred, you should see "#OK" on the next line.



18. To confirm your previous setting, key in "@GB" and you should see "#B5" on the next line. You can test the other commands in the same way.



6.7 Some Examples

In this section, we provide some examples of how to use command messages.

Environment Configuration:

Set up hyperterminal (see section 5.6 for detailed information):

- Baud-Rate: 115200 bps
- Data bits: 8
- Parity Check: None
- Stop Bits: 1
- Flow Control: None

Transmit Messages:

1. Command: @BE
   Do: Set CAN bit rate to 1Mbps.

2. Command: @S0

   Do: Configure receiving behaviors of CAN port; stop receiving when buffer is full, report in raw data and polling mode.

3. Command: @O100

   Do: Open CAN Port 1. Set it to normal mode and non-loopback.

4. Command: @t1000A00641238313233343536373 8

   Do: Transmit 100 messages every 1ms; ID=0x123, length=8 and data='12345678'.

Receive Messages: (Auto Report)

1. Command: @BE

   Do: Set CAN bit rate to 1Mbps.

2. Command: @S3

   Do: Configure receiving behaviors of CAN port; stop receiving if buffer is overflow, report data format and auto report mode.

3. Command: @O100

   Do: Open CAN port 1. Set it to normal mode and non-loopback.

4. Command: @S3

   Do: Set to data mode and report data automatically if CAN port is open.

Receive Messages: (Polling)

1. Command: @BE

   Do: Set CAN bit rate to 1Mbps.

2. Commands: @S2

   Do: Configure receiving behaviors of CAN port to stop receiving if buffer is overflow, report data format and polling mode.

3. Command: @O100

   Do: Open CAN port 1. Set it to normal mode and non-loopback.

4. Command: @Z1

   Do: Enable timestamp.

5. Command: @GR

   Do: Retrieve message out of receive buffer.

MEMO: